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ROMPS CRITICAL DESIGN REVIEW

Volume II-Robot Module Design Documentation

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**ROBOT MODULE
DESIGN
DOCUMENTATION**

**ROBOT MODULE
ROMPS MODIFICATIONS**

ROBOT MODULE MODIFICATIONS

November 16, 1992

The following modifications will be made to the Zymark Robot Module to meet the Remote Operated Material Processing System requirements:

- Modify the 'C' Robot Module Source Code supplied by Zymark in order to re-compile and test a baseline version of the Robot Module.
- Modify the axis terminology used by Zymark to be consistent with the axis terminology used by Goddard (Vertical = Elevation, Reach = Radial, Rotary = Azimuth).
- Modify the axis calibration factors to accommodate the ROMPS Robot.
- Modify error handling so that an error is always sent back to the interpreter if, for any reason, a command does not complete successfully.
- Add ROMPS Robot/XP commands.
- Add ROMPS EasyLab/Robot Command Variables.

EASYLAB COMMANDS DEFINITIONS

ROBOT MODULE EASYPAB COMMAND VARIABLES

Space Automated Research Center (SpARC)

December 3, 1992

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NAME: **S:ELEVATION**

SYNTAX: S:ELEVATION = x or ? S:ELEVATION

x = absolute elevation axis position in inches

$0 \leq x \leq 18$

DESCRIPTION: ELEVATION POSITION COMMAND VARIABLE
COMMANDCODE #9

Move elevation axis to an absolute position or get the current elevation axis position from the XP servo controller.

EXAMPLE: S:ELEVATION = 3

? S:ELEVATION
3

NAME: **S:RADIAL**

SYNTAX: S:RADIAL = x or ? S:RADIAL

x = absolute radial axis position in inches

$3 \leq x \leq 7$

DESCRIPTION: RADIAL POSITION COMMAND VARIABLE
COMMANDCODE #10

Move radial axis to an absolute position or get the current radial axis position from the XP servo controller.

EXAMPLE: S:RADIAL = 4.5

? S:RADIAL
4.5

NAME: **S:AZIMUTH**

SYNTAX: S:AZIMUTH = x or ? S:AZIMUTH

x = absolute azimuth axis position in degrees

$0 \leq x \leq 360$

DESCRIPTION: AZIMUTH POSITION COMMAND VARIABLE
 COMMANDCODE #11

Move azimuth axis to an absolute position or get the current azimuth axis position from the XP servo controller.

EXAMPLE: S:AZIMUTH = 180

? S:AZIMUTH
180

NAME: **S:SPEED**

SYNTAX: S:SPEED = x or ? S:SPEED

x = 3 axis speed. Speed is not a direct measure of units/time, but is a relative measure (i.e. 2 is faster than 1).

DESCRIPTION: 3 AXIS SPEED COMMAND VARIABLE
 COMMANDCODE #15

Set new speed for elevation, radial, and azimuth axes or return the last 3 axis speed setting. Note that the speed value returned reflects the actual axis speeds only if the last speed setting was a 3 axis speed. To guarantee the speed value returned is the actual axis speed, use the individual axis speed commands: S:ELEVATION.SPEED, S:RADIAL.SPEED, and S:AZIMUTH.SPEED.

EXAMPLE: S:SPEED = 2

? S:SPEED
2

NAME: **S:ELEVATION.SPEED**

SYNTAX: S:ELEVATION.SPEED = *x* or ? S:ELEVATION.SPEED

x = elevation axis speed. Speed is not a direct measure of units/time, but is a relative measure (i.e. 2 is faster than 1).

DESCRIPTION: ELEVATION SPEED COMMAND VARIABLE
COMMANDCODE #16

Set new speed for elevation axis or get the current speed setting from the XP servo controller.

EXAMPLE: S:ELEVATION.SPEED = 1

? S:ELEVATION.SPEED
1

NAME: **S:RADIAL.SPEED**

SYNTAX: S:RADIAL.SPEED = *x* or ? S:RADIAL.SPEED

x = radial axis speed. Speed is not a direct measure of units/time, but is a relative measure (i.e. 2 is faster than 1).

DESCRIPTION: RADIAL SPEED COMMAND VARIABLE
COMMANDCODE #17

Set new speed for radial axis or get the current speed setting from the XP servo controller.

EXAMPLE: S:RADIAL.SPEED = 3

? S:RADIAL.SPEED
3

NAME: S:SET.ABS

SYNTAX: S:SET.ABS <variable>

<variable> = absolute command variable or rack location.

DESCRIPTION: SET ABSOLUTE COMMAND VARIABLE
COMMANDCODE #28

Set last absolute position to the absolute or rack position defined by <variable>. No robot moves are executed. This command is used to define an absolute position before executing relative moves.

EXAMPLE: S:SET.ABS R1:RACK
S:C.REL\$

NAME: S:TRANS.ON

SYNTAX: S:TRANS.ON

DESCRIPTION: TRANSITION POSITION ON COMMAND
COMMANDCODE #31

Allow transitional moves. Once the current move is in the vicinity of it's target position, the next move can be executed.

EXAMPLE: S:TRANS.ON

NAME: **S:TRANS.OFF**

SYNTAX: S:TRANS.OFF

DESCRIPTION: TRANSITION POSITION OFF COMMAND
 COMMANDCODE #32

Do not allow transitional moves. The current move must be at it's target position before the next move can be executed.

EXAMPLE: S:TRANS.OFF

NAME: **S:GRIP**

SYNTAX: S:GRIP = x or ? S:GRIP

x = absolute gripper axis position in inches

$0 \leq x \leq .7$

DESCRIPTION: GRIP POSITION COMMAND VARIABLE
 COMMANDCODE #37

Move gripper axis to an absolute position or get the current gripper position from the XP servo controller.

EXAMPLE: S:GRIP = 0

? S:GRIP
0

NAME: **S:ELEVATION.CMD**

SYNTAX: S:ELEVATION.CMD = x or ? S:ELEVATION.CMD

x = absolute elevation axis position in inches

$0 \leq x \leq 18$

DESCRIPTION: COMMAND VARIABLE ELEVATION POSITION
COMMANDCODE #50

Define/modify or return the elevation position of a command variable. When defining/modifying an elevation position, the command variable isn't updated until an S:SET.BASE.CMD is executed. The elevation position returned from a query is from the last S:GET.BASE.CMD command.

EXAMPLE: S:GET.BASE.CMD <variable>
S:ELEVATION.CMD = 3
S:SET.BASE.CMD <variable>

NAME: **S:RADIAL.CMD**

SYNTAX: S:RADIAL.CMD = x or ? S:RADIAL.CMD

x = absolute radial axis position in inches

$3 \leq x \leq 7$

DESCRIPTION: COMMAND VARIABLE RADIAL POSITION
COMMANDCODE #51

Define/modify or return the radial position of a command variable. When defining/modifying a radial position, the command variable isn't updated until an S:SET.BASE.CMD is executed. The radial position returned from a query is from the last S:GET.BASE.CMD command.

EXAMPLE: S:GET.BASE.CMD <variable>
? S:RADIAL.CMD
4.5
S:RADIAL.CMD = 3.5
S:SET.BASE.CMD <variable>

NAME: **S:AZIMUTH.CMD**

SYNTAX: S:AZIMUTH.CMD = x or ? S:AZIMUTH.CMD

x = absolute azimuth axis position in degrees

$0 \leq x \leq 360$

DESCRIPTION: COMMAND VARIABLE AZIMUTH POSITION
 COMMANDCODE #52

Define/modify or return the azimuth position of a command variable. When defining/modifying an azimuth position, the command variable isn't updated until an S:SET.BASE.CMD is executed. The azimuth position returned from a query is from the last S:GET.BASE.CMD command.

EXAMPLE: S:ELEVATION.CMD = 3
 S:RADIAL.CMD = 3.5
 S:AZIMUTH.CMD = 180
 S:SET.BASE.CMD <variable>
 ? S:AZIMUTH.CMD
 180

NAME: **S:GRIP.CMD**

SYNTAX: S:GRIP.CMD = x or ? S:GRIP.CMD

x = absolute gripper axis position in inches

$0 \leq x \leq .7$

DESCRIPTION: COMMAND VARIABLE GRIP POSITION
 COMMANDCODE #53

Define/modify or return the grip position of a command variable. When defining/modifying a grip position, the command variable isn't updated until an S:SET.HAND.CMD is executed. The grip position returned from a query is from the last S:GET.HAND.CMD command.

EXAMPLE: S:GET.HAND.CMD
 S:GRIP.CMD = .5
 S:SET.HAND.CMD

NAME: **S:SET.BASE.CMD**

SYNTAX: S:SET.BASE.CMD <variable>

 <variable> = absolute command variable.

DESCRIPTION: SET BASE COMMAND VARIABLE
 COMMANDCODE #54

Define/modify the elevation, radial, and azimuth positions of a command variable.

EXAMPLE: S:GET.BASE.CMD <variable>
 ? S:ELEVATION
 1
 ? S:RADIAL
 3.5
 ? S:AZIMUTH
 175
 S:ELEVATION = 2
 S:RADIAL = 3.75
 S:AZIMUTH = 90
 S:SET.BASE.CMD <variable>

NAME: **S:GET.BASE.CMD**

SYNTAX: S:GET.BASE.CMD <variable>

 <variable> = absolute command variable.

DESCRIPTION: GET BASE COMMAND VARIABLE
 COMMANDCODE #55

Get the elevation, radial, and azimuth positions of a command variable.

EXAMPLE: S:GET.BASE.CMD <variable>
 ? S:ELEVATION
 1
 ? S:RADIAL
 3.75
 ? S:AZIMUTH
 175

NAME: **S:SET.HAND.CMD**

SYNTAX: S:SET.HAND.CMD <variable>

 <variable> = hand definition variable.

DESCRIPTION: SET HAND COMMAND VARIABLE
 COMMANDCODE #56

 Set the grip position of a hand definition variable.

EXAMPLE: S:GET.HAND.CMD <variable>
 ? S:GRIP
 .4
 S:GRIP = 0
 S:SET.HAND.CMD <variable>

NAME: **S:GET.HAND.CMD**

SYNTAX: S:GET.HAND.CMD <variable>

 <variable> = hand definition variable.

DESCRIPTION: GET HAND COMMAND VARIABLE
 COMMANDCODE #57

 Get the grip position of a hand definition variable.

EXAMPLE: S:GET.HAND.CMD <variable>
 ? S:GRIP
 0

NAME: **S:ZERO.ELEVATION**

SYNTAX: S:ZERO.ELEVATION

DESCRIPTION: ZERO ELEVATION AXIS
COMMANDCODE #58

Set the current elevation axis position to { 0 }. This command can be used to recover from a situation where the axis position is unknown.

EXAMPLE: S:ZERO.ELEVATION

NAME: **S:ZERO.RADIAL**

SYNTAX: S:ZERO.RADIAL

DESCRIPTION: ZERO RADIAL AXIS
COMMANDCODE #59

Set the current radial axis position to { 0 }. This command can be used to recover from a situation where the axis position is unknown.

EXAMPLE: S:ZERO.RADIAL

NAME: **S:ZERO.AZIMUTH**

SYNTAX: **S:ZERO.AZIMUTH**

DESCRIPTION: ZERO AZIMUTH AXIS
COMMANDCODE #60

Set the current azimuth axis position to { 0 }. This command can be used to recover from a situation where the axis position is unknown.

EXAMPLE: **S:ZERO.AZIMUTH**

NAME: **S:ZERO.GRIP**

SYNTAX: **S:ZERO.GRIP**

DESCRIPTION: ZERO GRIP AXIS
COMMANDCODE #61

Set the current grip axis position to { 0 }. This command can be used to recover from a situation where the axis position is unknown.

EXAMPLE: **S:ZERO.GRIP**

NAME: **S:CALIBRATE.ELEVATION**

SYNTAX: S:CALIBRATE.ELEVATION

DESCRIPTION: CALIBRATE ELEVATION AXIS
 COMMANDCODE #62

Determine where absolute zero is by moving the axis into the limit, backing away from the limit, and setting the axis position to {0}.

EXAMPLE: S:CALIBRATE.ELEVATION

NAME: **S:CALIBRATE.RADIAL**

SYNTAX: S:CALIBRATE.RADIAL

DESCRIPTION: CALIBRATE RADIAL AXIS
 COMMANDCODE #63

Determine where absolute zero is by moving the axis into the limit, backing away from the limit, and setting the axis position to {0}.

EXAMPLE: S:CALIBRATE.RADIAL

NAME: **S:CALIBRATE.AZIMUTH**

SYNTAX: S:CALIBRATE.AZIMUTH

DESCRIPTION: CALIBRATE AZIMUTH AXIS
 COMMANDCODE #64

Determine where absolute zero is by moving the axis into the limit, backing away from the limit, and setting the axis position to {0}.

EXAMPLE: S:CALIBRATE.AZIMUTH

NAME: **S:CALIBRATE.GRIP**

SYNTAX: S:CALIBRATE.GRIP

DESCRIPTION: CALIBRATE GRIP AXIS
 COMMANDCODE #65

Determine where absolute zero is by moving the axis into the limit, backing away from the limit, and setting the axis position to {0}.

EXAMPLE: S:CALIBRATE.GRIP

NAME: **S:ELEVATION.PGAIN**

SYNTAX: S:ELEVATION.PGAIN = x or ? S:ELEVATION.PGAIN

x = proportional gain term (KP) for servo calculations.

$0 \leq x \leq 255.999$ (accuracy of .004)

DESCRIPTION: ELEVATION PROPORTIONAL GAIN COMMAND
 COMMANDCODE #66

Define the proportional gain term (KP) used in the servo calculations for the elevation axis or get the current proportional gain term from the XP servo controller.

EXAMPLE: S:ELEVATION.PGAIN = 0
 ? S:ELEVATION.PGAIN
 0

NAME: **S:RADIAL.PGAIN**

SYNTAX: S:RADIAL.PGAIN = x or ? S:RADIAL.PGAIN

x = proportional gain term (KP) for servo calculations.

$0 \leq x \leq 255.999$ (accuracy of .004)

DESCRIPTION: RADIAL PROPORTIONAL GAIN COMMAND
 COMMANDCODE #67

Define the proportional gain term (KP) used in the servo calculations for the radial axis or get the current proportional gain term from the XP servo controller.

EXAMPLE: S:RADIAL.PGAIN = 0
 ? S:RADIAL.PGAIN
 0

NAME: **S:AZIMUTH.PGAIN**

SYNTAX: S:AZIMUTH.PGAIN = x or ? S:AZIMUTH.PGAIN

x = proportional gain term (KP) for servo calculations.

0 <= x <= 255.999 (accuracy of .004)

DESCRIPTION: AZIMUTH PROPORTIONAL GAIN COMMAND
COMMANDCODE #68

Define the proportional gain term (KP) used in the servo calculations for the azimuth axis or get the current proportional gain term from the XP servo controller.

EXAMPLE: S:AZIMUTH.PGAIN = 0
 ? S:AZIMUTH.PGAIN
 0

NAME: **S:GRIP.PGAIN**

SYNTAX: S:GRIP.PGAIN = x or ? S:GRIP.PGAIN

x = proportional gain term (KP) for servo calculations.

0 <= x <= 255.999 (accuracy of .004)

DESCRIPTION: GRIP PROPORTIONAL GAIN COMMAND
COMMANDCODE #69

Define the proportional gain term (KP) used in the servo calculations for the grip axis or get the current proportional gain term from the XP servo controller.

EXAMPLE: S:GRIP.PGAIN = 0
 ? S:GRIP.PGAIN
 0

NAME: S:ELEVATION.IGAIN

SYNTAX: S:ELEVATION.IGAIN = x or ? S:ELEVATION.IGAIN

x = integral gain term (KI) for servo calculations.

0 <= x <= 255.999 (accuracy of .004)

DESCRIPTION: ELEVATION INTEGRAL GAIN COMMAND
COMMANDCODE #70

Define the integral gain term (KI) used in the servo calculations for the elevation axis or get the current integral gain term from the XP servo controller.

EXAMPLE: S:ELEVATION.IGAIN = 0
? S:ELEVATION.IGAIN
0

NAME: S:RADIAL.IGAIN

SYNTAX: S:RADIAL.IGAIN = x or ? S:RADIAL.IGAIN

x = integral gain term (KI) for servo calculations.

0 <= x <= 255.999 (accuracy of .004)

DESCRIPTION: RADIAL INTEGRAL GAIN COMMAND
COMMANDCODE #71

Define the integral gain term (KI) used in the servo calculations for the radial axis or get the current integral gain term from the XP servo controller.

EXAMPLE: S:RADIAL.IGAIN = 0
? S:RADIAL.IGAIN
0

NAME: **S:AZIMUTH.IGAIN**

SYNTAX: **S:AZIMUTH.IGAIN = x or ? S:AZIMUTH.IGAIN**

x = integral gain term (KI) for servo calculations.

0 <= *x* <= 255.999 (accuracy of .004)

DESCRIPTION: AZIMUTH INTEGRAL GAIN COMMAND
 COMMANDCODE #72

Define the integral gain term (KI) used in the servo calculations for the azimuth axis or get the current integral gain term from the XP servo controller.

EXAMPLE: **S:AZIMUTH.IGAIN = 0**
 ? S:AZIMUTH.IGAIN
 0

NAME: **S:GRIP.IGAIN**

SYNTAX: **S:GRIP.IGAIN = x or ? S:GRIP.IGAIN**

x = integral gain term (KI) for servo calculations.

0 <= *x* <= 255.999 (accuracy of .004)

DESCRIPTION: GRIP INTEGRAL GAIN COMMAND
 COMMANDCODE #73

Define the integral gain term (KI) used in the servo calculations for the grip axis or get the current integral gain term from the XP servo controller.

EXAMPLE: **S:GRIP.IGAIN = 0**
 ? S:GRIP.IGAIN
 0

NAME: **S:ELEVATION.DGAIN**

SYNTAX: S:ELEVATION.DGAIN = x or ? S:ELEVATION.DGAIN

x = derivative gain term (KD) for servo calculations.

$0 \leq x \leq 255.999$ (accuracy of .004)

DESCRIPTION: ELEVATION DERIVATIVE GAIN COMMAND
COMMANDCODE #74

Define the derivative gain term (KD) used in the servo calculations for the elevation axis or get the current derivative gain term from the XP servo controller.

EXAMPLE: S:ELEVATION.DGAIN = 0
? S:ELEVATION.DGAIN
0

NAME: **S:RADIAL.DGAIN**

SYNTAX: S:RADIAL.DGAIN = x or ? S:RADIAL.DGAIN

x = derivative gain term (KD) for servo calculations.

$0 \leq x \leq 255.999$ (accuracy of .004)

DESCRIPTION: RADIAL DERIVATIVE GAIN COMMAND
COMMANDCODE #75

Define the derivative gain term (KD) used in the servo calculations for the radial axis or get the current derivative gain term from the XP servo controller.

EXAMPLE: S:RADIAL.DGAIN = 0
? S:RADIAL.DGAIN
0

NAME: S:AZIMUTH.DGAIN

SYNTAX: S:AZIMUTH.DGAIN = x or ? S:AZIMUTH.DGAIN

x = derivative gain term (KD) for servo calculations.

$0 \leq x \leq 255.999$ (accuracy of .004)

DESCRIPTION: AZIMUTH DERIVATIVE GAIN COMMAND
COMMANDCODE #76

Define the derivative gain term (KD) used in the servo calculations for the azimuth axis or get the current derivative gain term from the XP servo controller.

EXAMPLE: S:AZIMUTH.DGAIN = 0
? S:AZIMUTH.DGAIN
0

NAME: S:GRIP.DGAIN

SYNTAX: S:GRIP.DGAIN = x or ? S:GRIP.DGAIN

x = derivative gain term (KD) for servo calculations.

$0 \leq x \leq 255.999$ (accuracy of .004)

DESCRIPTION: GRIP DERIVATIVE GAIN COMMAND
COMMANDCODE #77

Define the derivative gain term (KD) used in the servo calculations for the grip axis or get the current derivative gain term from the XP servo controller.

EXAMPLE: S:GRIP.DGAIN = 0
? S:GRIP.DGAIN
0

NAME: **S:ELEVATION.ILIMIT**

SYNTAX: **S:ELEVATION.ILIMIT = x** or **? S:ELEVATION.ILIMIT**

x = inetgrator limit for servo calculations.

$0 \leq x \leq 255.999$ (accuracy of .004)

DESCRIPTION: ELEVATION INTEGRATOR LIMIT COMMAND
COMMANDCODE #78

Define the integrator limit used in the servo calculations for the elevation axis or get the current integrator limit from the XP servo controller.

EXAMPLE: **S:ELEVATION.ILIMIT = 0**
? S:ELEVATION.ILIMIT
0

NAME: **S:RADIAL.ILIMIT**

SYNTAX: **S:RADIAL.ILIMIT = x** or **? S:RADIAL.ILIMIT**

x = integrator limit for servo calculations.

$0 \leq x \leq 255.999$ (accuracy of .004)

DESCRIPTION: RADIAL INTEGRATOR LIMIT COMMAND
COMMANDCODE #79

Define the integrator limit used in the servo calculations for the radial axis or get the current integrator limit from the XP servo controller.

EXAMPLE: **S:RADIAL.ILIMIT = 0**
? S:RADIAL.ILIMIT
0

NAME: **S:AZIMUTH.ILIMIT**

SYNTAX: **S:AZIMUTH.ILIMIT = x or ? S:AZIMUTH.ILIMIT**

x = integrator limit for servo calculations.

0 <= x <= 255.999 (accuracy of .004)

DESCRIPTION: AZIMUTH INTEGRATOR LIMIT COMMAND
COMMANDCODE #80

Define the integrator limit used in the servo calculations for the azimuth axis or get the current integrator limit from the XP servo controller.

EXAMPLE: **S:AZIMUTH.ILIMIT = 0**
 ? S:AZIMUTH.ILIMIT
 0

NAME: **S:GRIP.ILIMIT**

SYNTAX: **S:GRIP.ILIMIT = x or ? S:GRIP.ILIMIT**

x = integrator limit for servo calculations.

0 <= x <= 255.999 (accuracy of .004)

DESCRIPTION: GRIP INTEGRATOR LIMIT COMMAND
COMMANDCODE #81

Define the integrator limit used in the servo calculations for the grip axis or get the current integrator limit from the XP servo controller.

EXAMPLE: **S:GRIP.ILIMIT = 0**
 ? S:GRIP.ILIMIT
 0

NAME: **S:ELEVATION.IWINDOW**

SYNTAX: S:ELEVATION.IWINDOW = x or ? S:ELEVATION.IWINDOW

x = integrator window for servo calculations.

$0 \leq x \leq 255.999$ (accuracy of .004)

DESCRIPTION: ELEVATION INTEGRATOR WINDOW COMMAND
 COMMANDCODE #82

Define the integrator window used in the servo calculations for the elevation axis or get the current integrator window from the XP servo controller.

EXAMPLE: S:ELEVATION.IWINDOW = 0
 ? S:ELEVATION.IWINDOW
 0

NAME: **S:RADIAL.IWINDOW**

SYNTAX: S:RADIAL.IWINDOW = x or ? S:RADIAL.IWINDOW

x = integrator window for servo calculations.

$0 \leq x \leq 255.999$ (accuracy of .004)

DESCRIPTION: RADIAL INTEGRATOR WINDOW COMMAND
 COMMANDCODE #83

Define the integrator window used in the servo calculations for the radial axis or get the current integrator window from the XP servo controller.

EXAMPLE: S:RADIAL.IWINDOW = 0
 ? S:RADIAL.IWINDOW
 0

NAME: S:AZIMUTH.IWINDOW

SYNTAX: S:AZIMUTH.IWINDOW = x or ? S:AZIMUTH.IWINDOW

x = integrator window for servo calculations.

$0 \leq x \leq 255.999$ (accuracy of .004)

DESCRIPTION: AZIMUTH INTEGRATOR WINDOW COMMAND
COMMANDCODE #84

Define the integrator window used in the servo calculations for the azimuth axis or get the current integrator window from the XP servo controller.

EXAMPLE: S:AZIMUTH.IWINDOW = 0
? S:AZIMUTH.IWINDOW
0

NAME: S:GRIP.IWINDOW

SYNTAX: S:GRIP.IWINDOW = x or ? S:GRIP.IWINDOW

x = integrator window for servo calculations.

$0 \leq x \leq 255.999$ (accuracy of .004)

DESCRIPTION: GRIP INTEGRATOR WINDOW COMMAND
COMMANDCODE #85

Define the integrator window used in the servo calculations for the grip axis or get the current integrator window from the XP servo controller.

EXAMPLE: S:GRIP.IWINDOW = 0
? S:GRIP.IWINDOW

NAME: **S:ELEVATION.EOT.OVERRIDE**

SYNTAX: **S:ELEVATION.EOT.OVERRIDE = 0/1**
or
? S:ELEVATION.EOT.OVERRIDE

0 = don't override
1 = override

DESCRIPTION: ELEVATION END OF TRAVEL OVERRIDE COMMAND
COMMANDCODE #86

Override/don't override end of travel fault condition or get the current end of travel override setting from the XP controller. If an end of travel fault is overridden, it is important to clear the override after the fault condition is removed. If the override is not cleared, end of travel on that axis cannot be detected.

EXAMPLE: **? S:ELEVATION.EOT.OVERRIDE**
1
S:ELEVATION.EOT.OVERRIDE = 0

NAME: **S:RADIAL.EOT.OVERRIDE**

SYNTAX: **S:RADIAL.EOT.OVERRIDE = 0/1**
or
? S:RADIAL.EOT.OVERRIDE

0 = don't override
1 = override

DESCRIPTION: RADIAL END OF TRAVEL OVERRIDE COMMAND
COMMANDCODE #87

Override/don't override end of travel fault condition or get the current end of travel override setting from the XP controller. If an end of travel fault is overridden, it is important to clear the override after the fault condition is removed. If the override is not cleared, end of travel on that axis cannot be detected.

EXAMPLE: **? S:RADIAL.EOT.OVERRIDE**
1
S:RADIAL.EOT.OVERRIDE = 0

NAME: **S:AZIMUTH.EOT.OVERRIDE**

SYNTAX: **S:AZIMUTH.EOT.OVERRIDE = 0/1**
or
? S:AZIMUTH.EOT.OVERRIDE

0 = don't override
1 = override

DESCRIPTION: AZIMUTH END OF TRAVEL OVERRIDE COMMAND
COMMANDCODE #88

Override/don't override end of travel fault condition or get the current end of travel override setting from the XP controller. If an end of travel fault is overridden, it is important to clear the override after the fault condition is removed. If the override is not cleared, end of travel on that axis cannot be detected.

EXAMPLE: **? S:AZIMUTH.EOT.OVERRIDE**
1
S:AZIMUTH.EOT.OVERRIDE = 0

NAME: **S:GRIP.EOT.OVERRIDE**

SYNTAX: **S:GRIP.EOT.OVERRIDE = 0/1**
or
? S:GRIP.EOT.OVERRIDE

0 = don't override
1 = override

DESCRIPTION: GRIP END OF TRAVEL OVERRIDE COMMAND
COMMANDCODE #89

Override/don't override end of travel fault condition or get the current end of travel override setting from the XP controller. If an end of travel fault is overridden, it is important to clear the override after the fault condition is removed. If the override is not cleared, end of travel on that axis cannot be detected.

EXAMPLE: **? S:GRIP.EOT.OVERRIDE**
1
S:GRIP.EOT.OVERRIDE = 0

NAME: **S:ELEVATION.OVF.OVERRIDE**

SYNTAX: S:ELEVATION.OVF.OVERRIDE = 0/1
or
? S:ELEVATION.OVF.OVERRIDE

0 = don't override
1 = override

DESCRIPTION: ELEVATION OVERFORCE OVERRIDE COMMAND
COMMANDCODE #90

Override/don't override overforce fault condition or get the current overforce override setting from the XP controller. If an overforce fault condition is overridden, it is important to clear the override after the fault condition is removed. If the override is not cleared, overforce on that axis cannot be detected.

EXAMPLE: ? S:ELEVATION.OVF.OVERRIDE
1
S:ELEVATION.OVF.OVERRIDE = 0

NAME: **S:RADIAL.OVF.OVERRIDE**

SYNTAX: S:RADIAL.OVF.OVERRIDE = 0/1
or
? S:RADIAL.OVF.OVERRIDE

0 = don't override
1 = override

DESCRIPTION: RADIAL OVERFORCE OVERRIDE COMMAND
COMMANDCODE #91

Override/don't override overforce fault condition or get the current overforce override setting from the XP controller. If an overforce fault condition is overridden, it is important to clear the override after the fault condition is removed. If the override is not cleared, overforce on that axis cannot be detected.

EXAMPLE: ? S:RADIAL.OVF.OVERRIDE
1
S:RADIAL.OVF.OVERRIDE = 0

NAME: S:AZIMUTH.OVF.OVERRIDE

SYNTAX: S:AZIMUTH.OVF.OVERRIDE = 0/1
or
? S:AZIMUTH.OVF.OVERRIDE

0 = don't override
1 = override

DESCRIPTION: AZIMUTH OVERFORCE OVERRIDE COMMAND
COMMANDCODE #92

Override/don't override overforce fault condition or get the current overforce override setting from the XP controller. If an overforce fault condition is overridden, it is important to clear the override after the fault condition is removed. If the override is not cleared, overforce on that axis cannot be detected.

EXAMPLE: ? S:AZIMUTH.OVF.OVERRIDE
1
S:AZIMUTH.OVF.OVERRIDE = 0

NAME: S:GRIP.OVF.OVERRIDE

SYNTAX: S:GRIP.OVF.OVERRIDE = 0/1
or
? S:GRIP.OVF.OVERRIDE

0 = don't override
1 = override

DESCRIPTION: GRIP OVERFORCE OVERRIDE COMMAND
COMMANDCODE #93

Override/don't override overforce fault condition or get the current overforce override setting from the XP controller. If an overforce fault condition is overridden, it is important to clear the override after the fault condition is removed. If the override is not cleared, overforce on that axis cannot be detected.

EXAMPLE: ? S:GRIP.OVF.OVERRIDE
1
S:GRIP.OVF.OVERRIDE = 0

NAME: S:OVF.STATUS

SYNTAX: ? S:OVF.STATUS

DESCRIPTION: OVERFORCE STATUS COMMAND
COMMANDCODE #94

Get the limit status from the XP controller and return a bitmapped status byte containing the overforce status for all applicable axes:

Bit 0	Left gripper is in 'open' overforce state
Bit 1	Left gripper is in 'closed' overforce state
Bit 2	Right gripper is in 'open' overforce state
Bit 3	Right gripper is in 'closed' overforce state
Bit 4	Radial axis is in 'in' overforce state
Bit 5	Radial axis is in 'out' overforce state
Bit 6	Elevation axis is in 'up' overforce state
Bit 7	Elevation axis is in 'down' overforce state

EXAMPLE: ? S:OVF.STATUS
0

NAME: S:EOT.STATUS

SYNTAX: ? S:EOT.STATUS

DESCRIPTION: END OF TRAVEL STATUS COMMAND
COMMANDCODE #95

Get the limit status from the XP controller and return a bitmapped status byte containing the end of travel status for all axes:

Bit 0	Gripper is in 'open' end of travel
Bit 1	Gripper is 'closed' end of travel
Bit 2	Azimuth axis is in 'left' end of travel
Bit 3	Azimuth axis is in 'right' end of travel
Bit 4	Radial axis is in 'in' end of travel
Bit 5	Radial axis is in 'out' end of travel
Bit 6	Elevation axis is in 'up' end of travel
Bit 7	Elevation axis is in 'down' end of travel

EXAMPLE: ? S:EOT.STATUS
0

NAME: **S:VER.STATUS**

SYNTAX: ? S:VER.STATUS

DESCRIPTION: VELOCITY ERROR STATUS COMMAND
 COMMANDCODE #96

Get the limit status from the XP controller and return a bitmapped status byte containing the velocity error status for all axes:

Bit 0	Gripper axis stalled
Bit 1	Azimuth axis stalled
Bit 2	Radial axis stalled
Bit 3	Elevation axis stalled
Bit 4	Not used
Bit 5	Not used
Bit 6	Not used
Bit 7	Not used

EXAMPLE: ? S:VER.STATUS
0

NAME: **S:BASE.MOVE.STATUS**

SYNTAX: ? S:BASE.MOVE.STATUS

DESCRIPTION: BASE MOVE STATUS COMMAND
 COMMANDCODE #97

Get the move status from the XP controller and return a bitmapped status byte containing the move status for the base:

Bit 0	Azimuth axis failed to reach position
Bit 1	Vertical axis failed to reach position
Bit 2	Reach axis failed to reach position
Bit 3	Not used
Bit 4	Not used
Bit 5	Not used
Bit 6	Not used
Bit 7	Not used

EXAMPLE: ? S:BASE.MOVE.STATUS
0

NAME: **S:GRIP.MOVE.STATUS**

SYNTAX: ? S:GRIP.MOVE.STATUS

DESCRIPTION: GRIP MOVE STATUS COMMAND
 COMMANDCODE #98

Get the hand status from the XP controller and return a bitmapped status byte containing the move status for the gripper:

Bit 0	Not used
Bit 1	Not used
Bit 2	Gripper failed to reach position
Bit 3	Not used
Bit 4	Not used
Bit 5	Not used
Bit 6	Not used
Bit 7	Not used

EXAMPLE: ? S:GRIP.MOVE.STATUS
 0

NAME: **S:COMM.STATUS**

SYNTAX: ? S:COMM.STATUS

DESCRIPTION: COMMUNICATION STATUS COMMAND
 COMMANDCODE #99

Return a bitmapped status byte containing the communication status of the last XP servo command:

Bit 0	Not used
Bit 1	Not used
Bit 2	Not used
Bit 3	Not used
Bit 4	Invalid checksum
Bit 5	Invalid command code
Bit 6	Invalid byte count
Bit 7	Interbyte timeout

EXAMPLE: ? S:COMM.STATUS
 0

NAME: **S:MODULE.STATUS**

SYNTAX: ? S:MODULE.STATUS

DESCRIPTION: ROBOT MODULE STATUS COMMAND
 COMMANDCODE #100

Return the status of the last EasyLab command:

- 1 = Hard abort
- 2 = User stop
- 3 = XP Servo communication error
- 4 = End of travel fault
- 5 = Overforce fault
- 6 = Velocity error
- 7 = Base fault
- 8 = Gripper fault
- 9 = Robot cannot sign on
- 10 = Robot version is not available
- 11 = Invalid robot command
- 12 = Command is not for this robot
- 13 = Memory request denied (insufficient memory)
- 14 = Dictionary entry does not exist
- 15 = Dictionary entry already exists
- 16 = Illegal rack index

EXAMPLE: ? S:MODULE.STATUS
0

NAME: **S:ERROR.DESCRPTION**

SYNTAX: ? S:ERROR.DESCRPTION

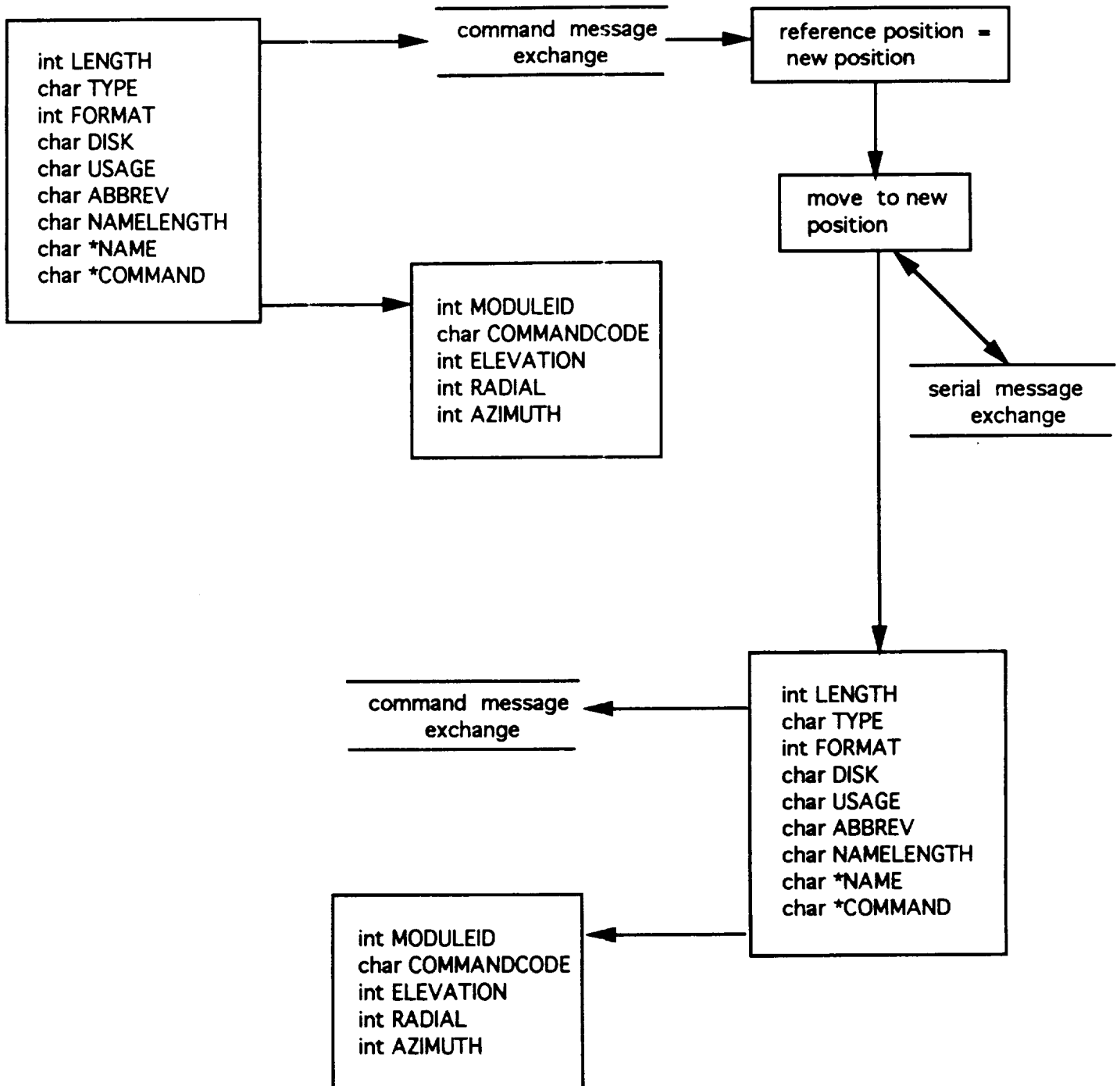
DESCRIPTION: ERROR DESCRIPTION COMMAND
 COMMANDCODE #101

Return a description of the last error.

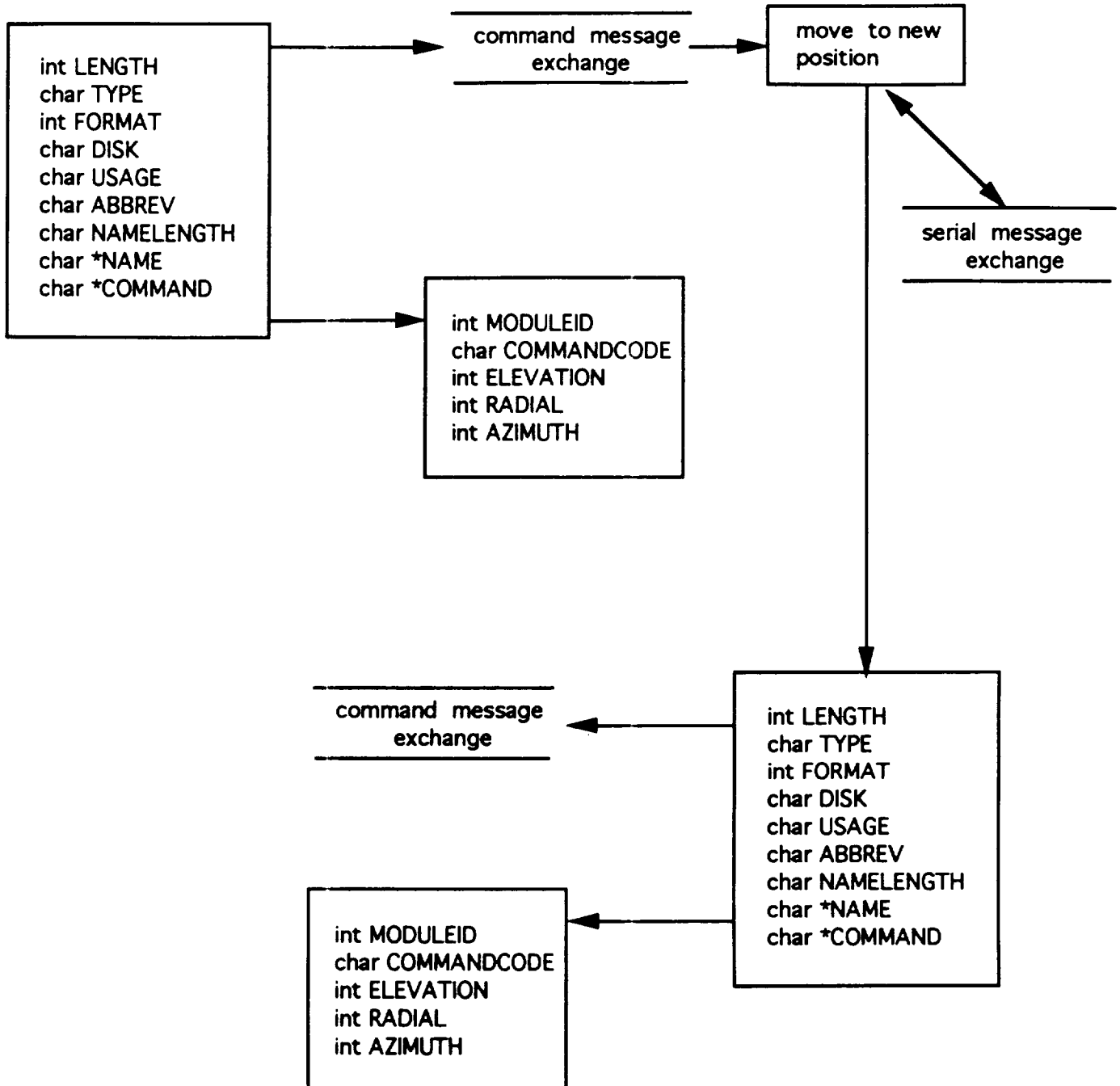
EXAMPLE: ? S:ERROR.DESCRPTION
NOT IN POSITION

**ROBOT
EASYPYLAB COMMANDS
FLOW CHARTS**

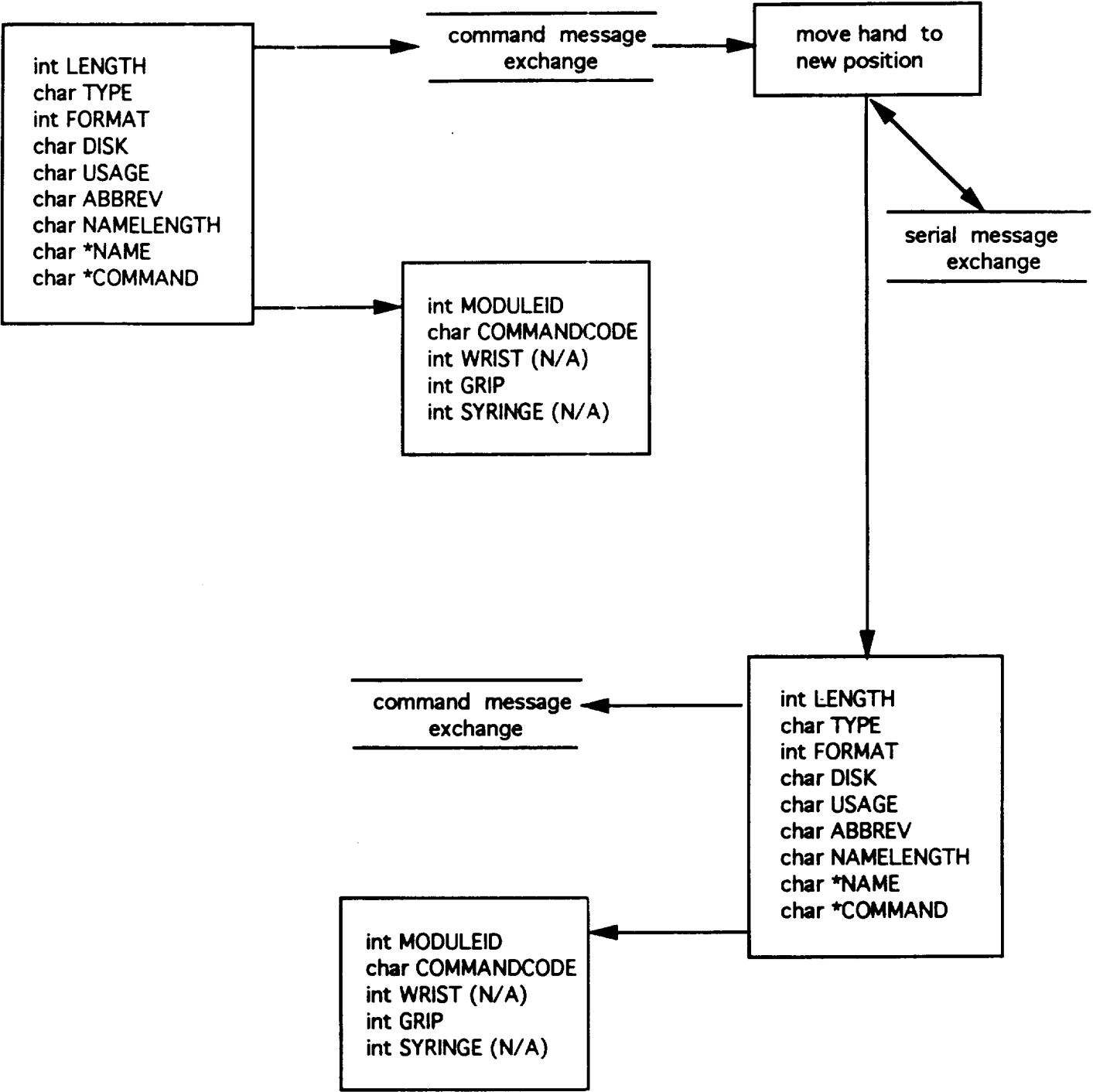
ABSOLUTE POSITION COMMANDCODE #1



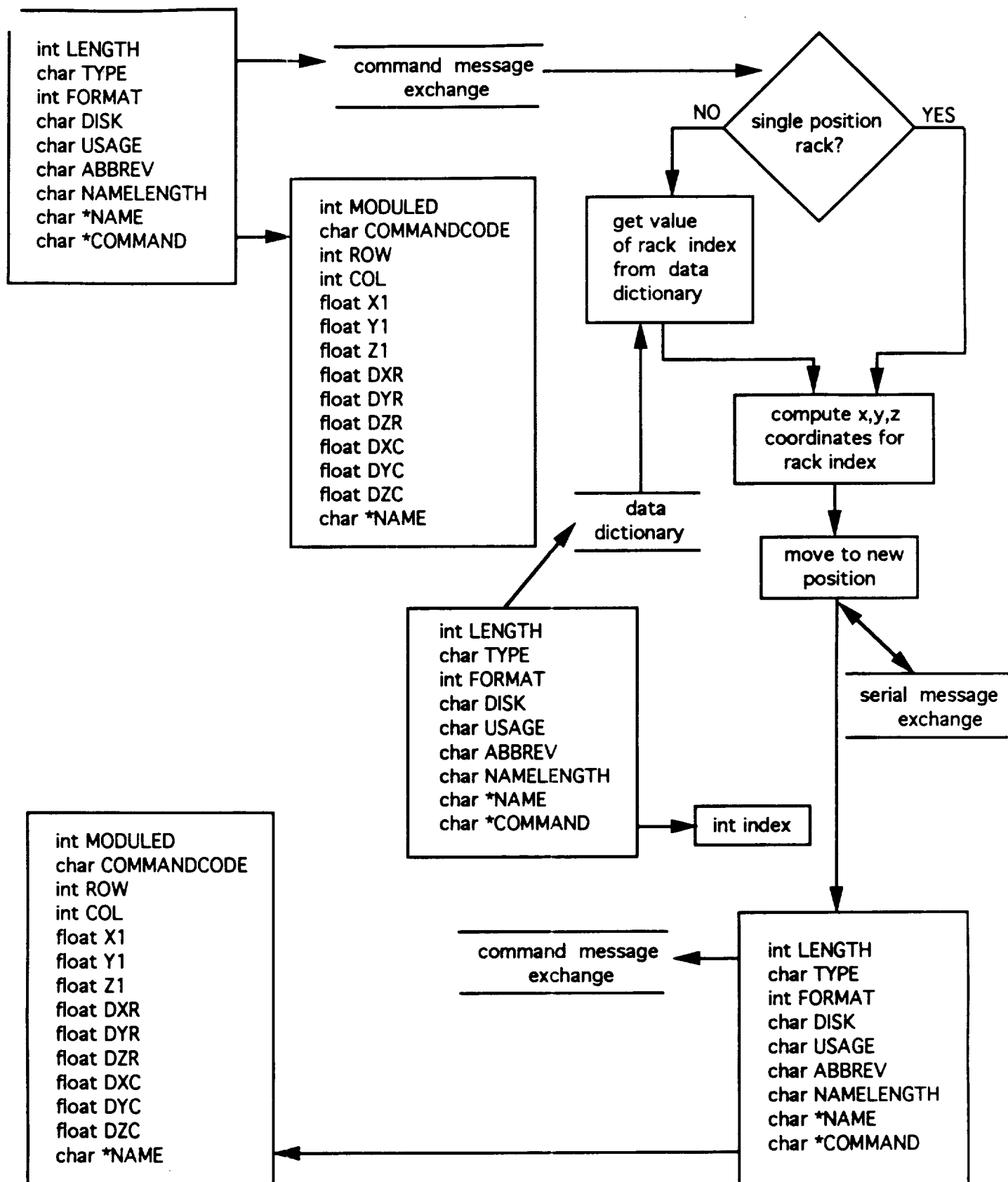
RELATIVE POSITION
COMMANDCODE #2

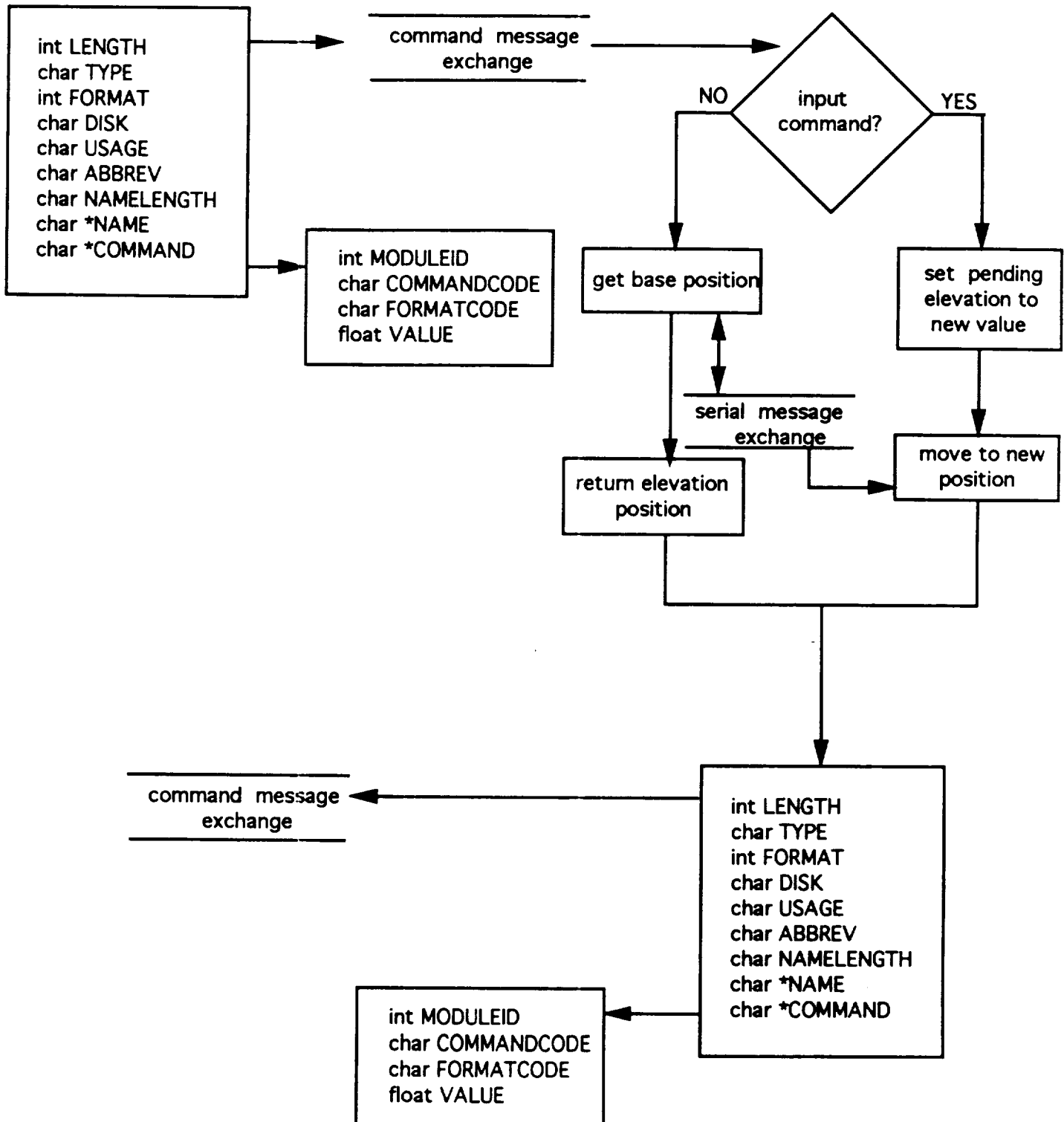


HAND LOCATION
COMMANDCODE #3

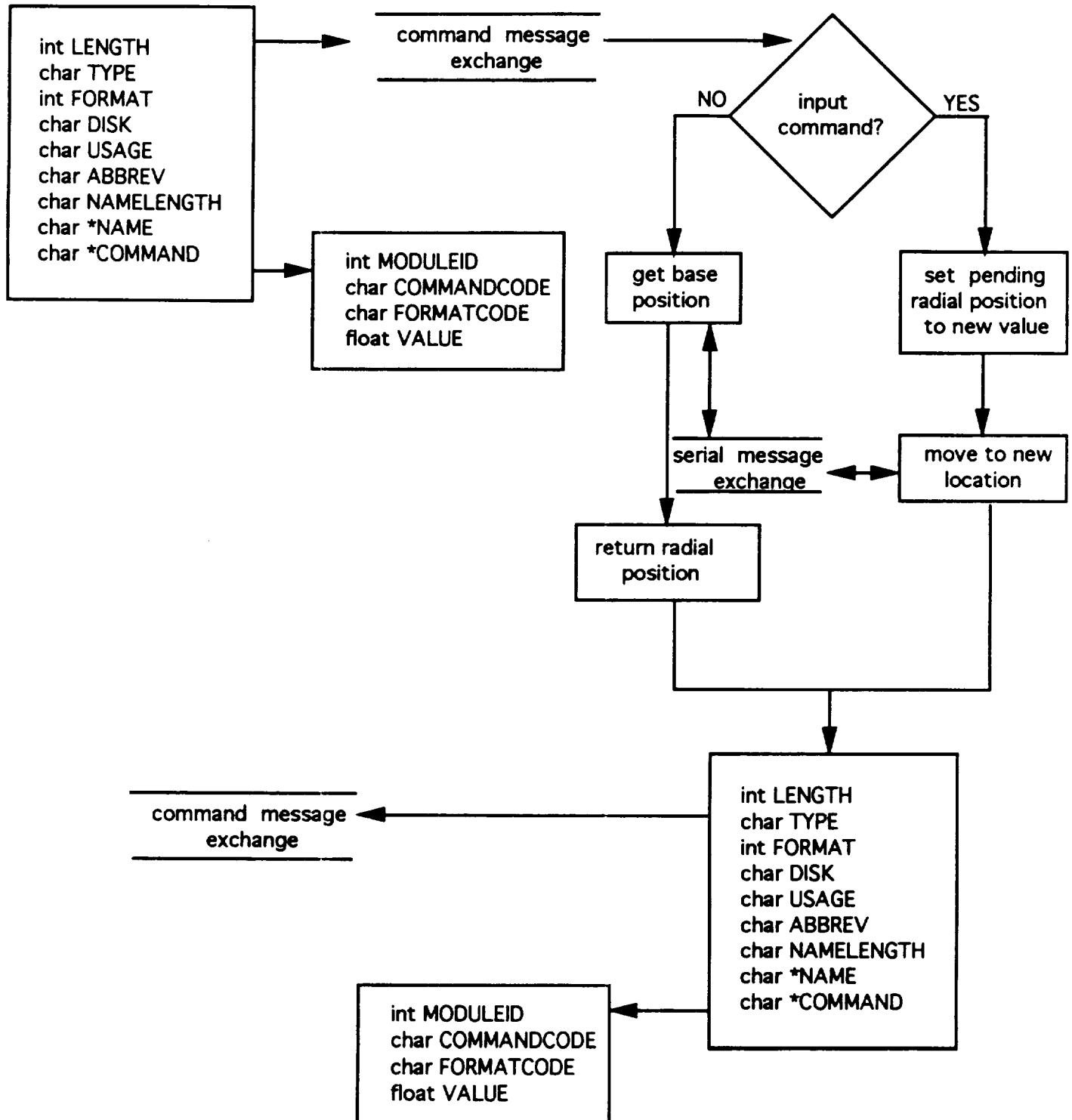


RACK POSITION COMMANDCODE #4



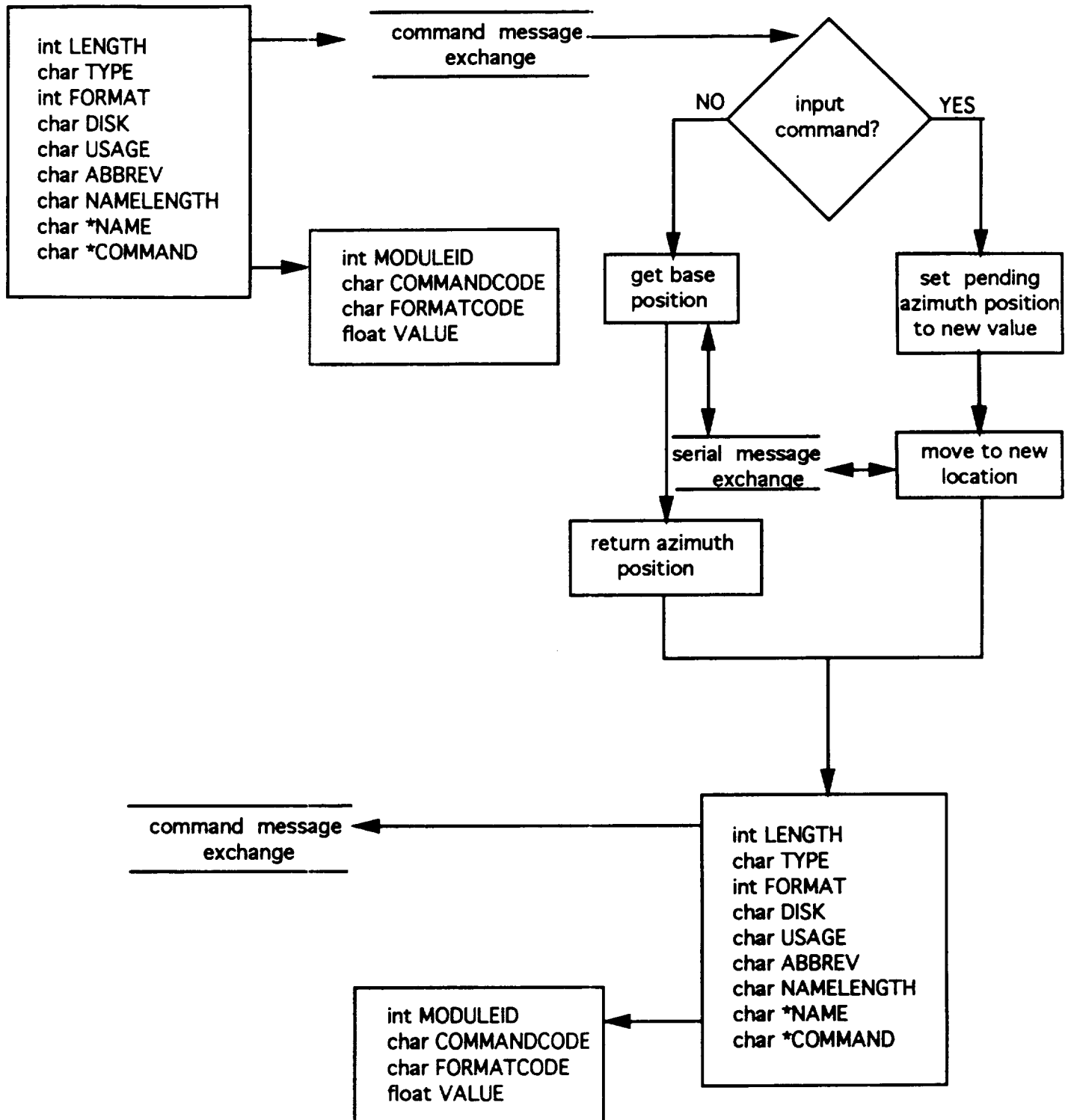
ELEVATION POSITION COMMAND VARIABLE
COMMANDCODE #9

**RADIAL POSITION COMMAND VARIABLE
COMMANDCODE #10**



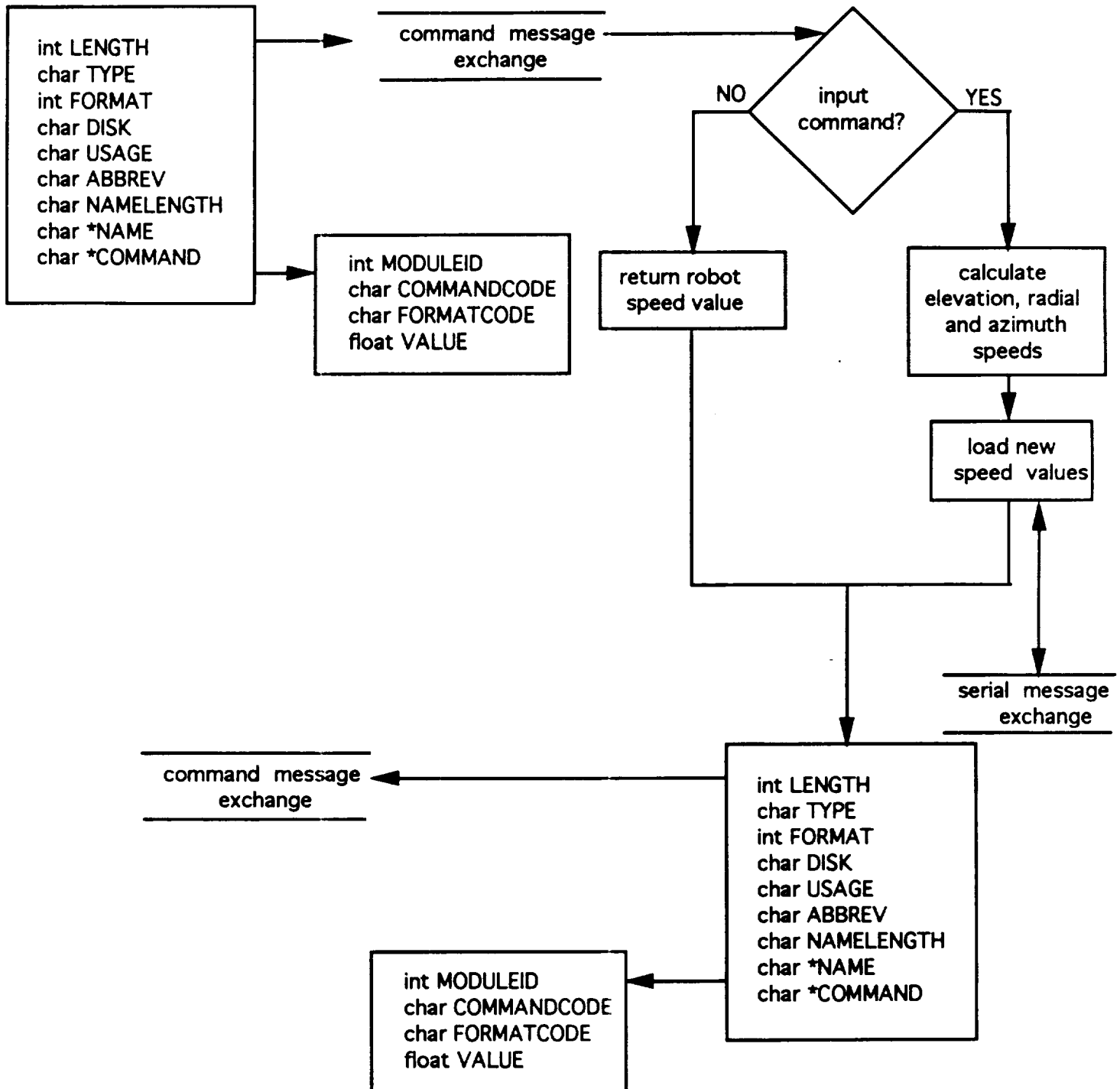
AZIMUTH POSITION COMMAND VARIABLE

COMMANDCODE #11

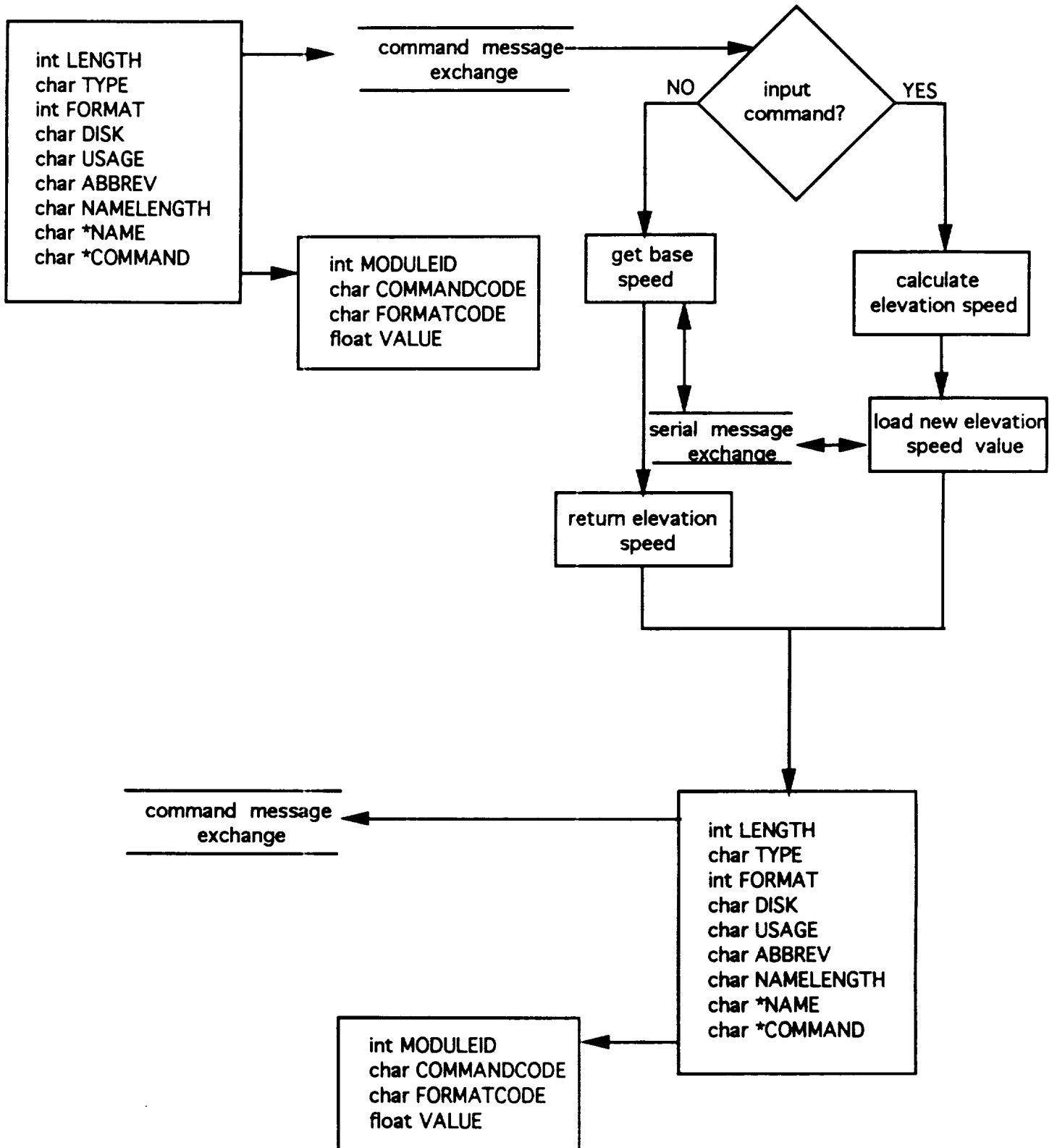


3 AXIS SPEED COMMAND VARIABLE COMMANDCODE #15

PRECEDING PAGE BLANK NOT FILMED

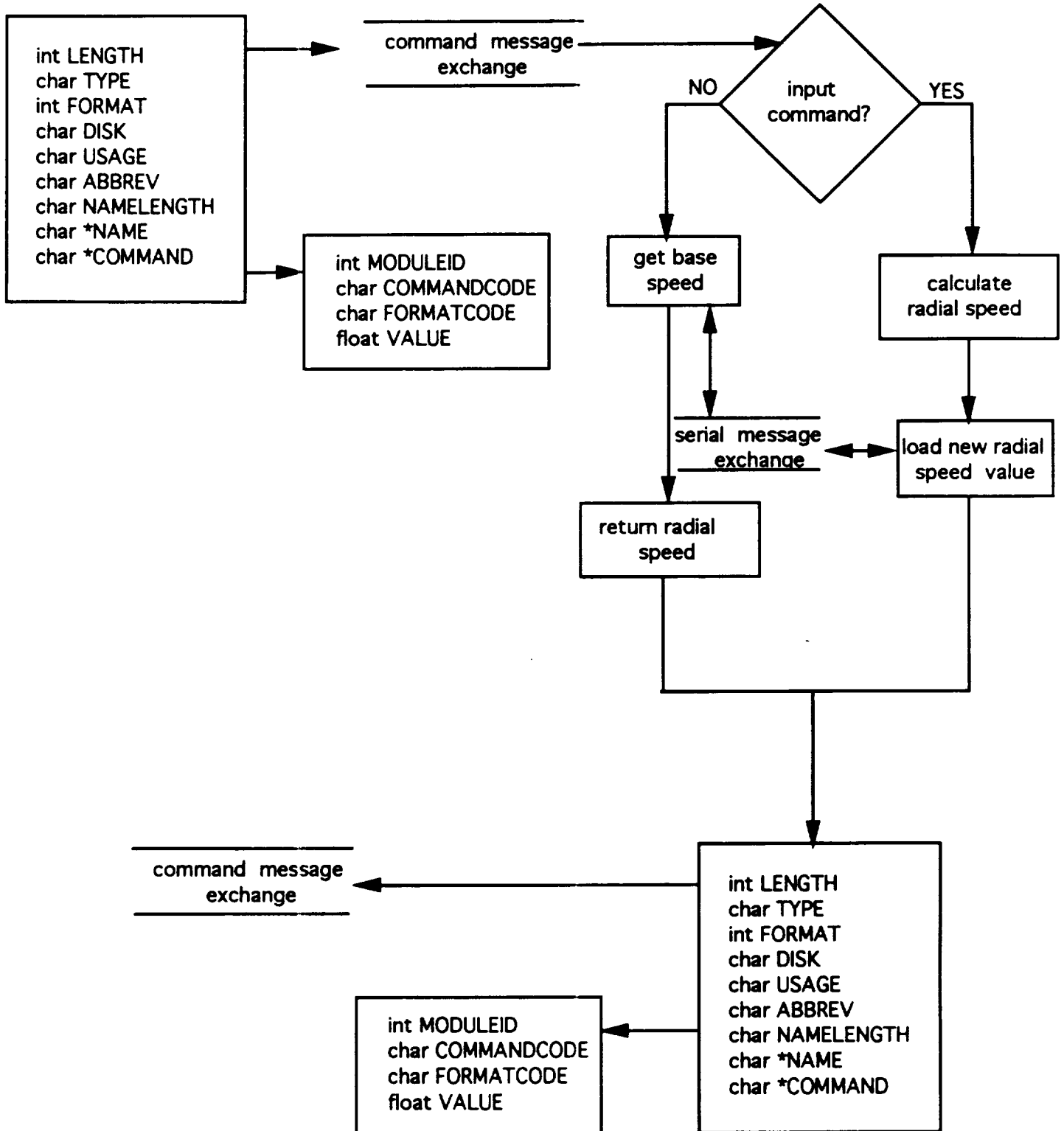


ELEVATION SPEED COMMAND VARIABLE
COMMANDCODE #16

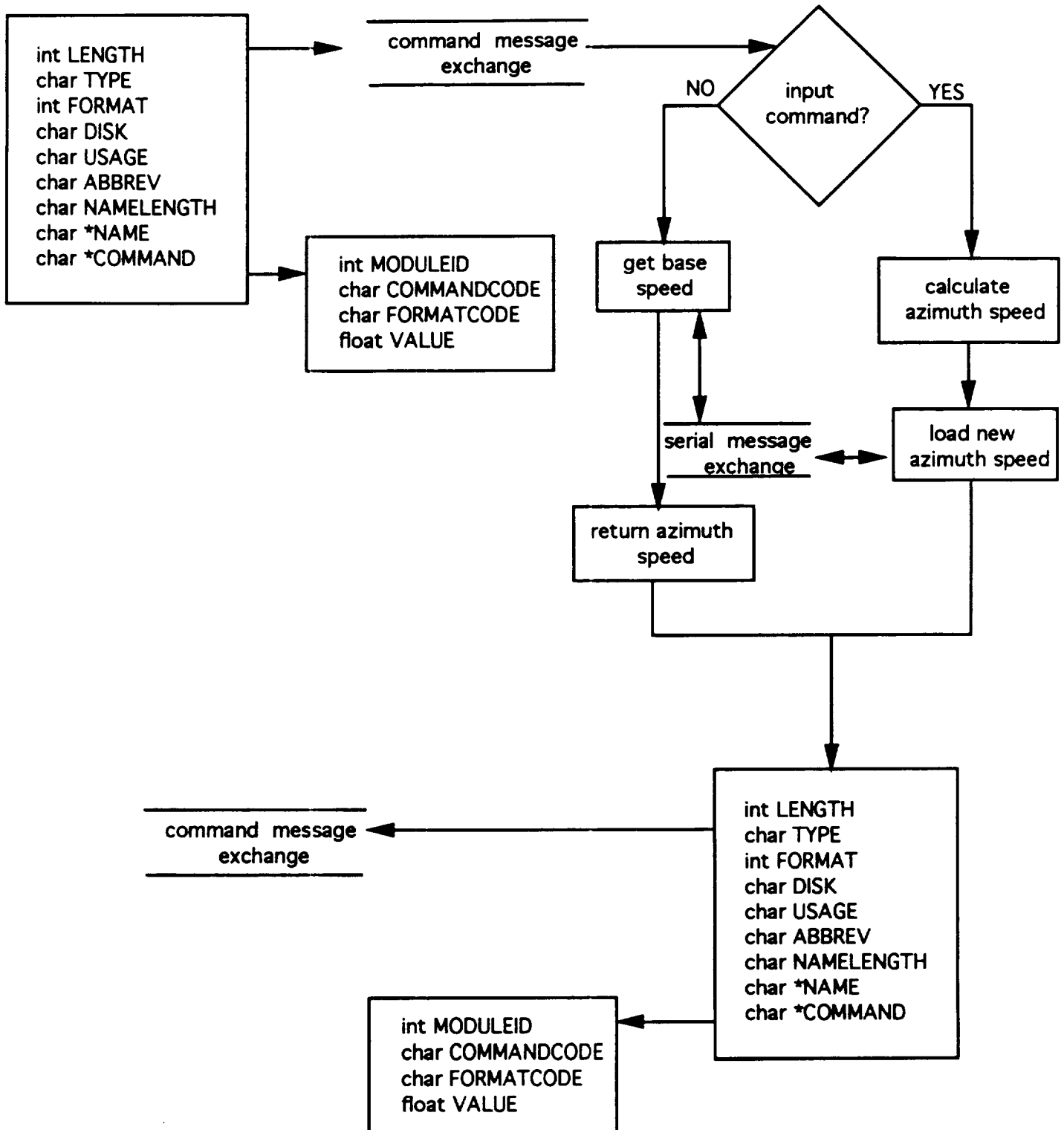


RADIAL SPEED COMMAND VARIABLE COMMANDCODE #17

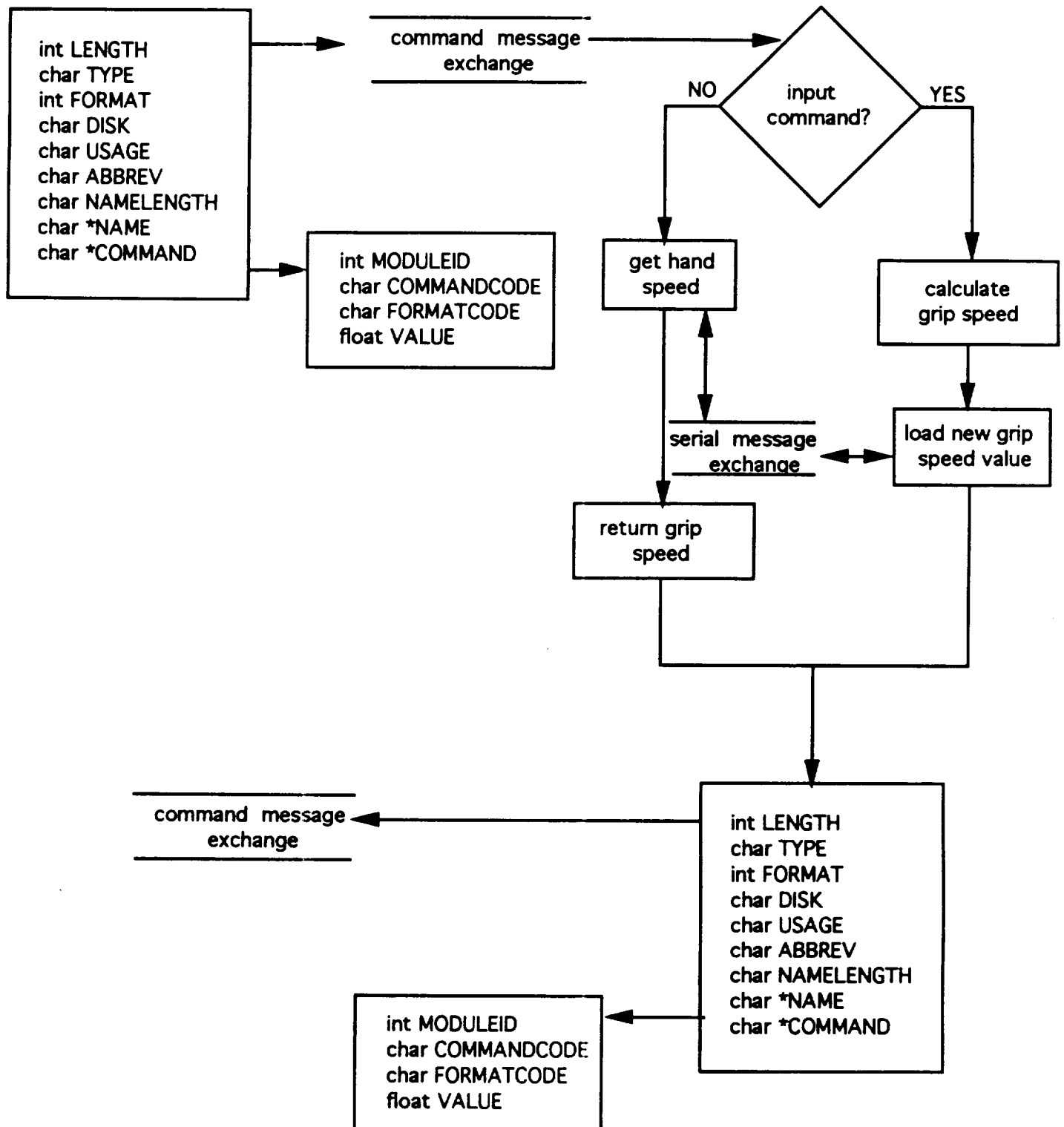
(RECORDING VALUE BEARS NO RELATIONSHIP TO NAME)



AZIMUTH SPEED COMMAND VARIABLE COMMANDCODE #18

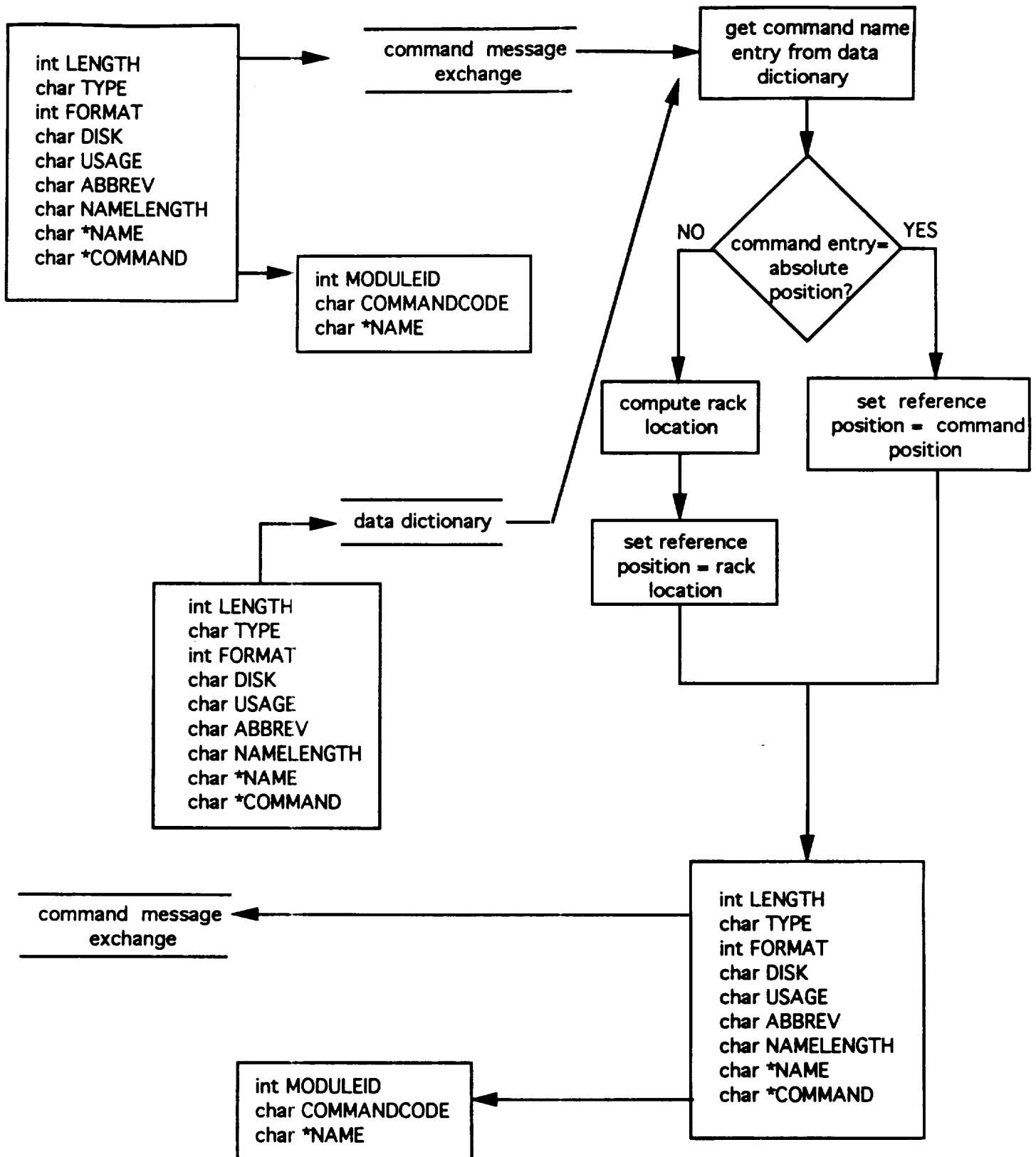


GRIP SPEED COMMAND VARIABLE COMMANDCODE #20



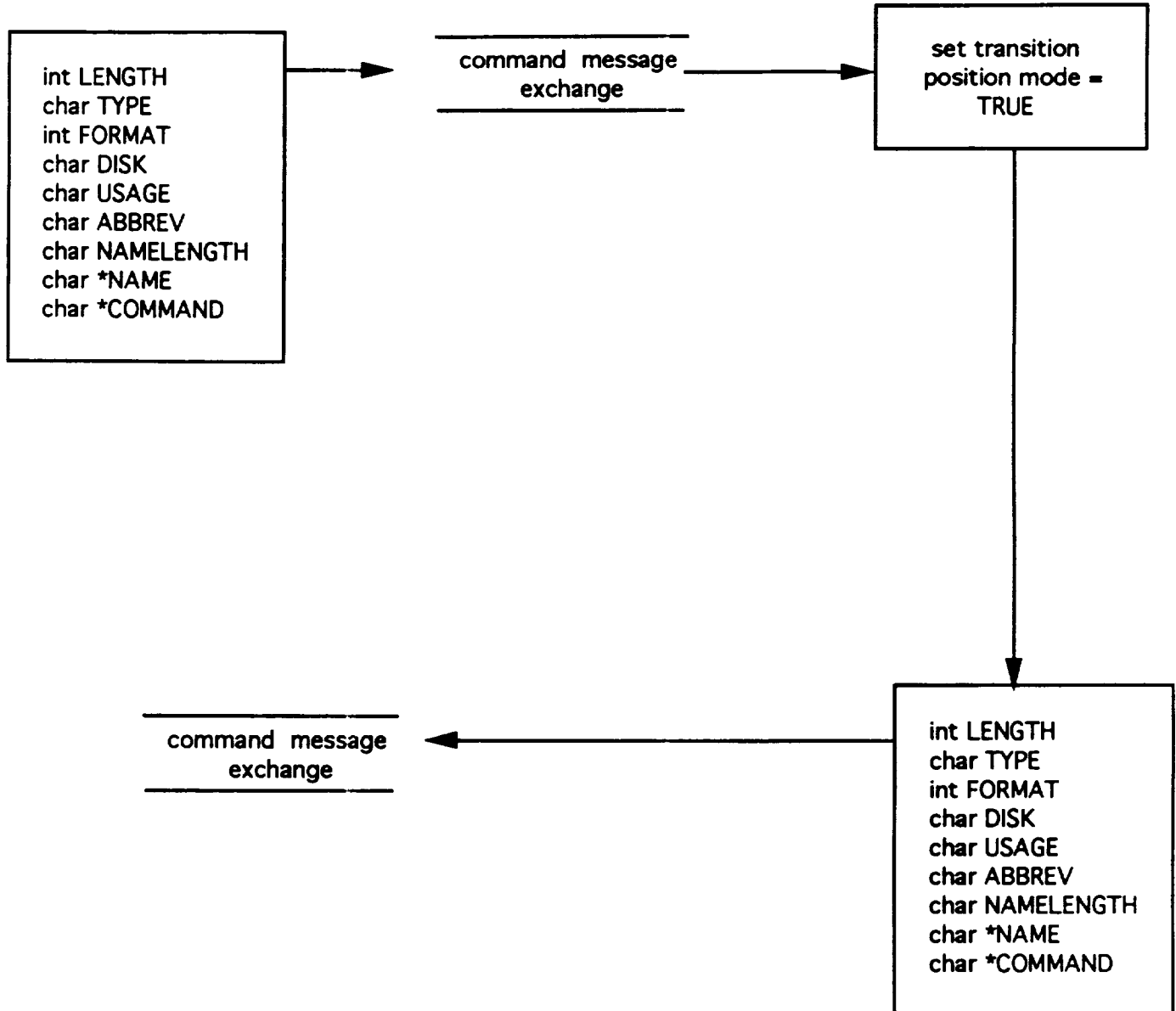
SET ABSOLUTE COMMAND VARIABLE COMMANDCODE #28

PRECEDED PAGE BLACK NOT FILLED

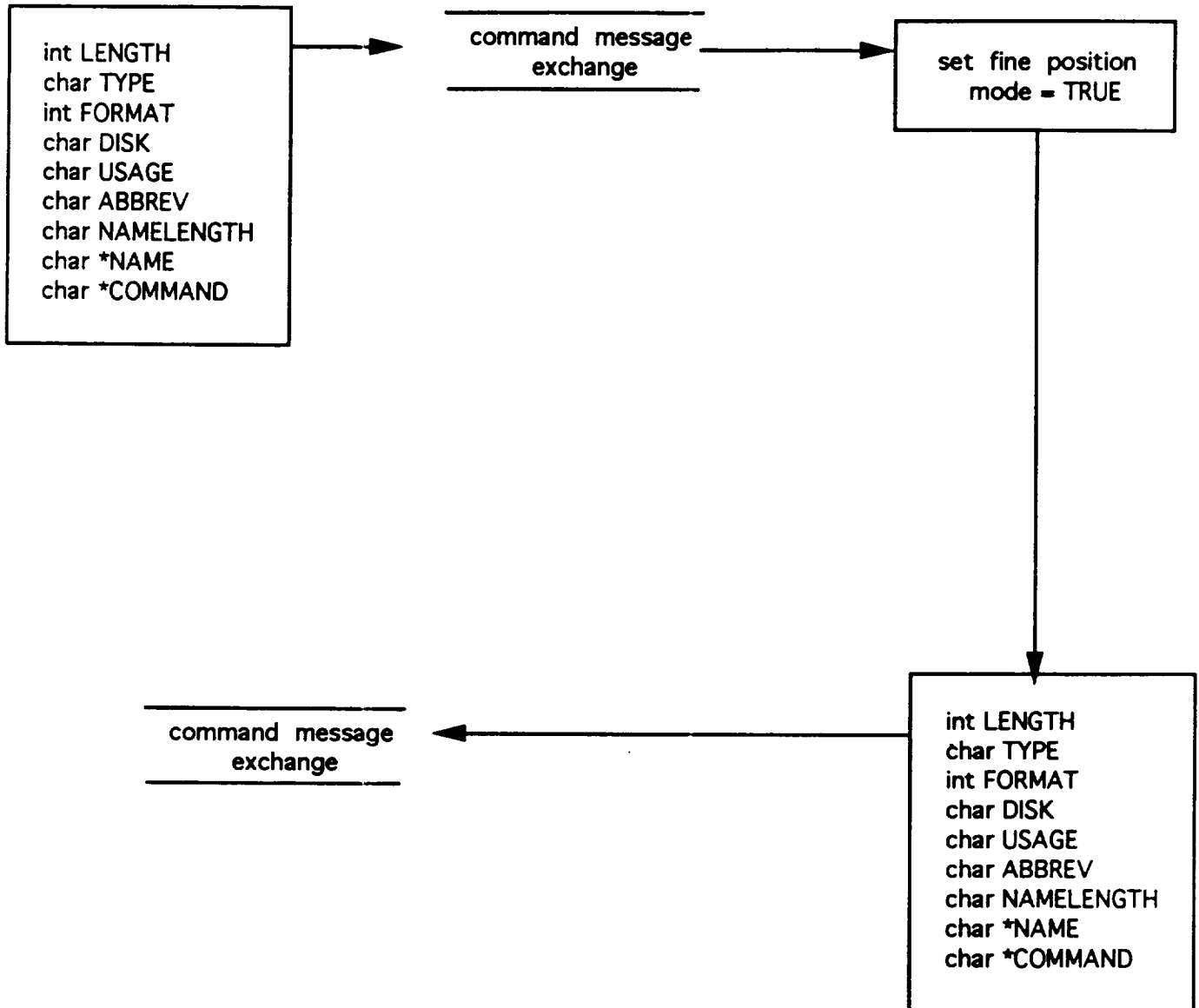


TRANSITION POSITION ON COMMAND
COMMANDCODE #31

PRECEDING PAGE PLANS NOT FILLED

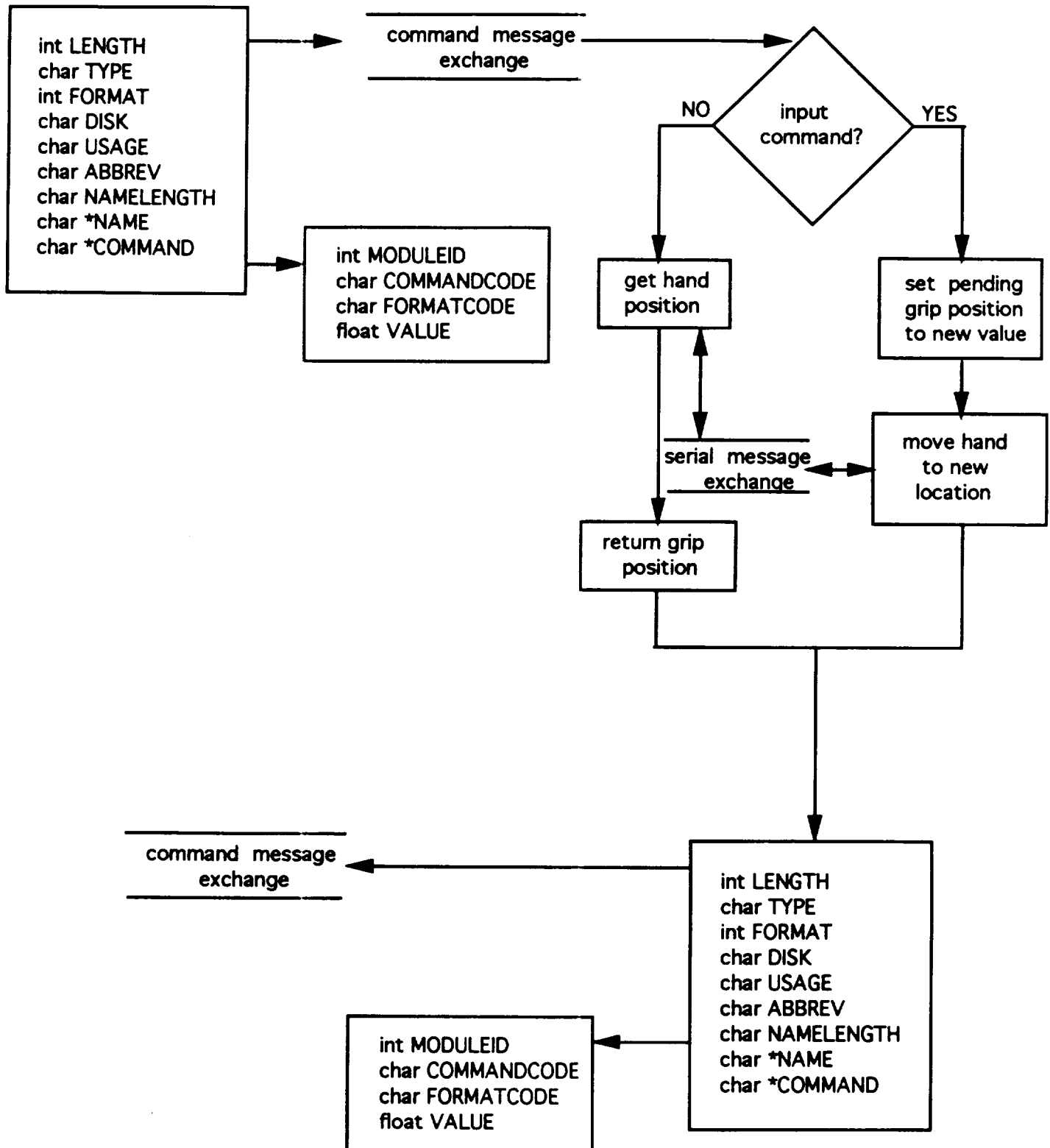


TRANSITION POSITION OFF COMMAND
COMMANDCODE #32



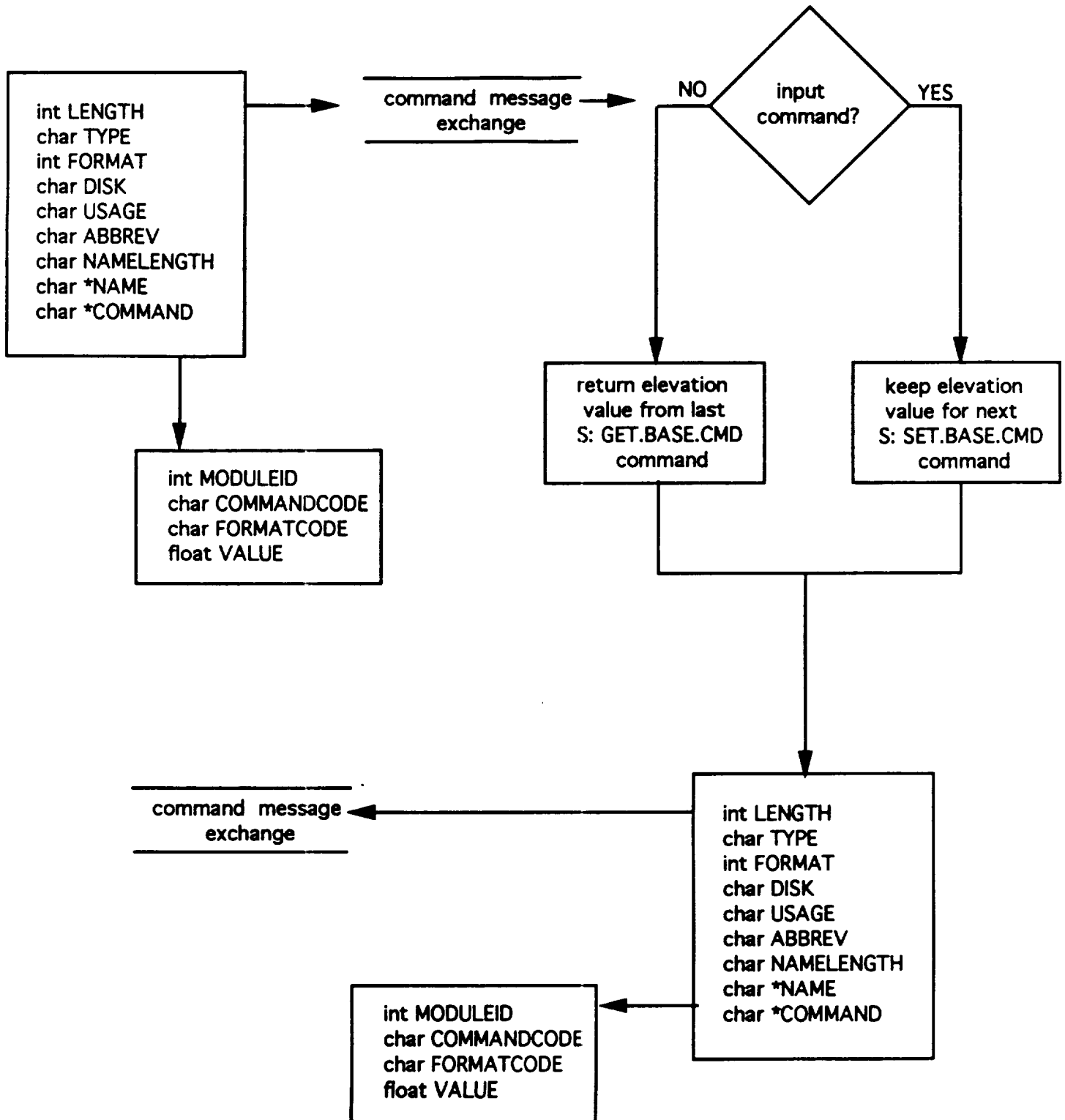
GRIP POSITION COMMAND VARIABLE COMMANDCODE #37

PRECEDING PAGE BLANK NOT FILLED

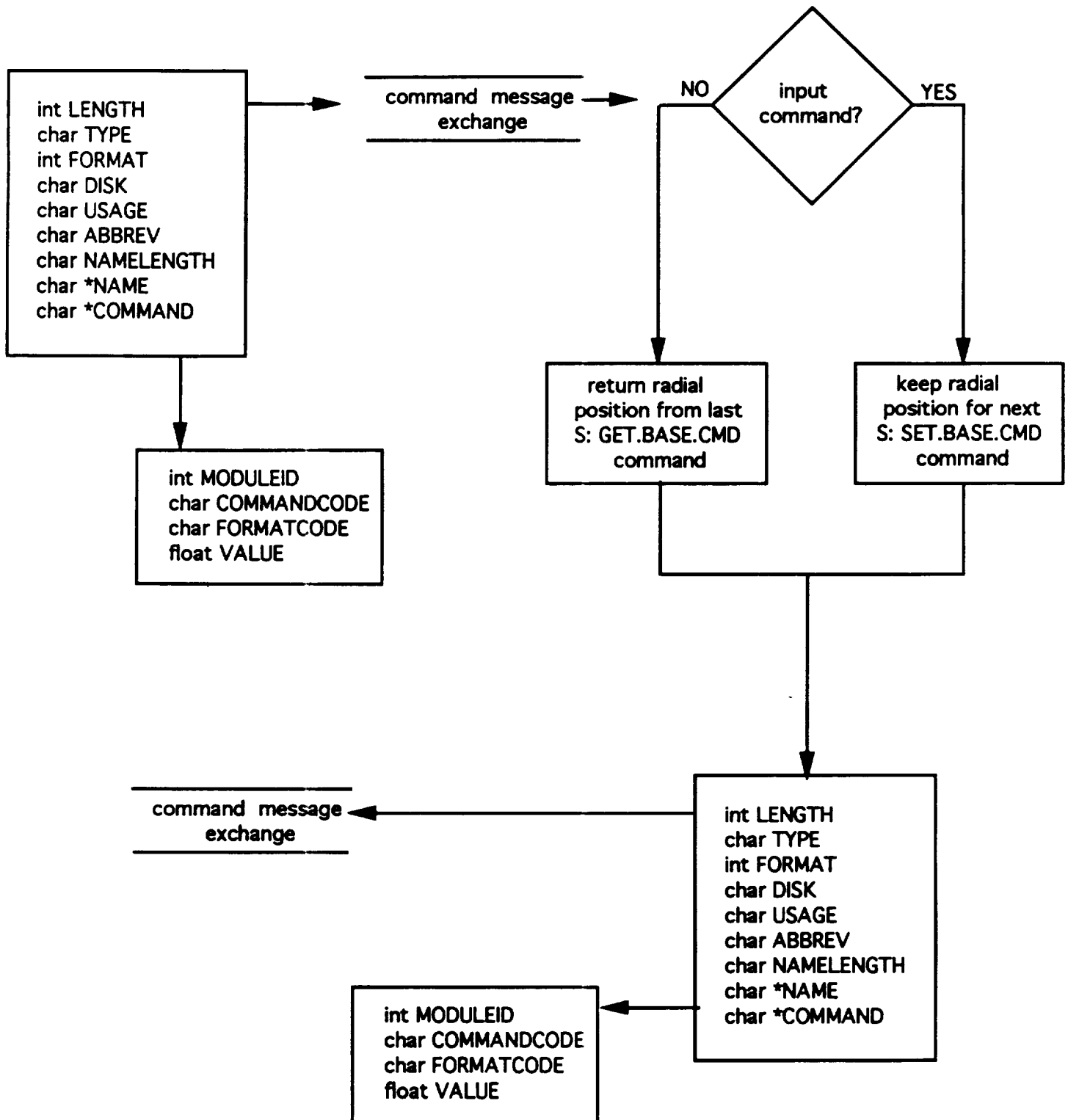


COMMAND VARIABLE ELEVATION POSITION
COMMANDCODE #50

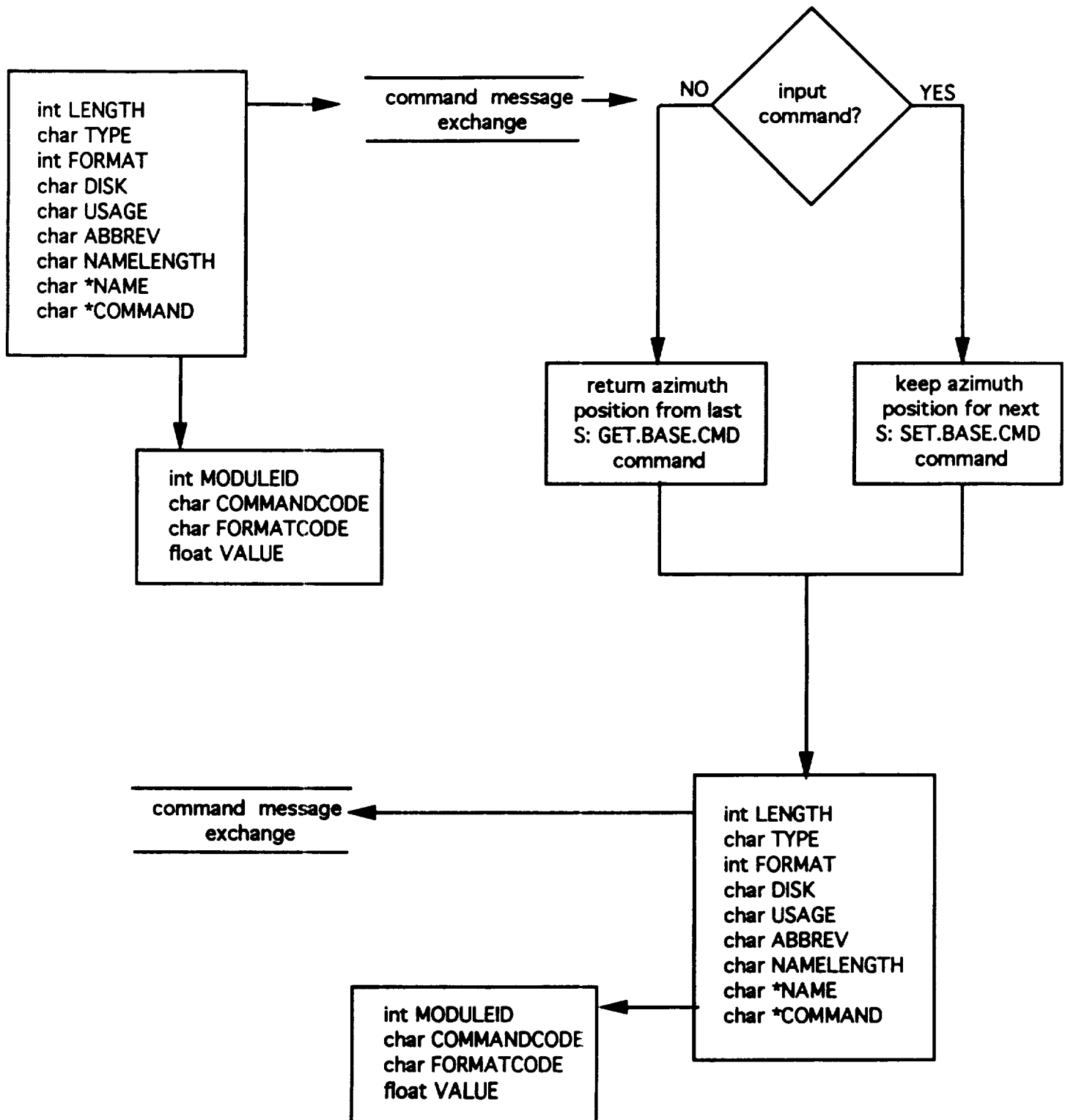
PRECEDING PAGE BLANK NOT FILLED



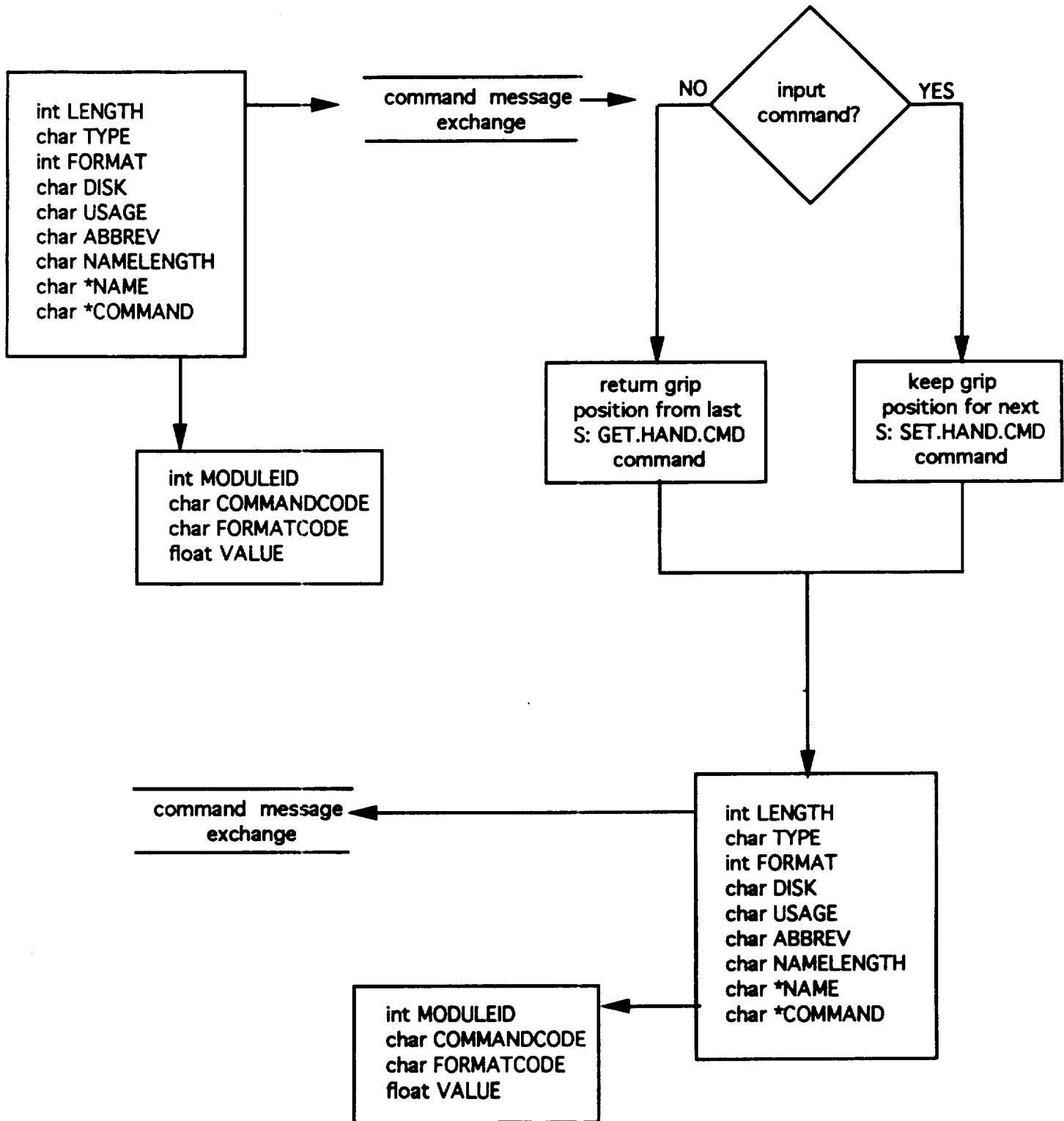
COMMAND VARIABLE RADIAL POSITION COMMANDCODE #51



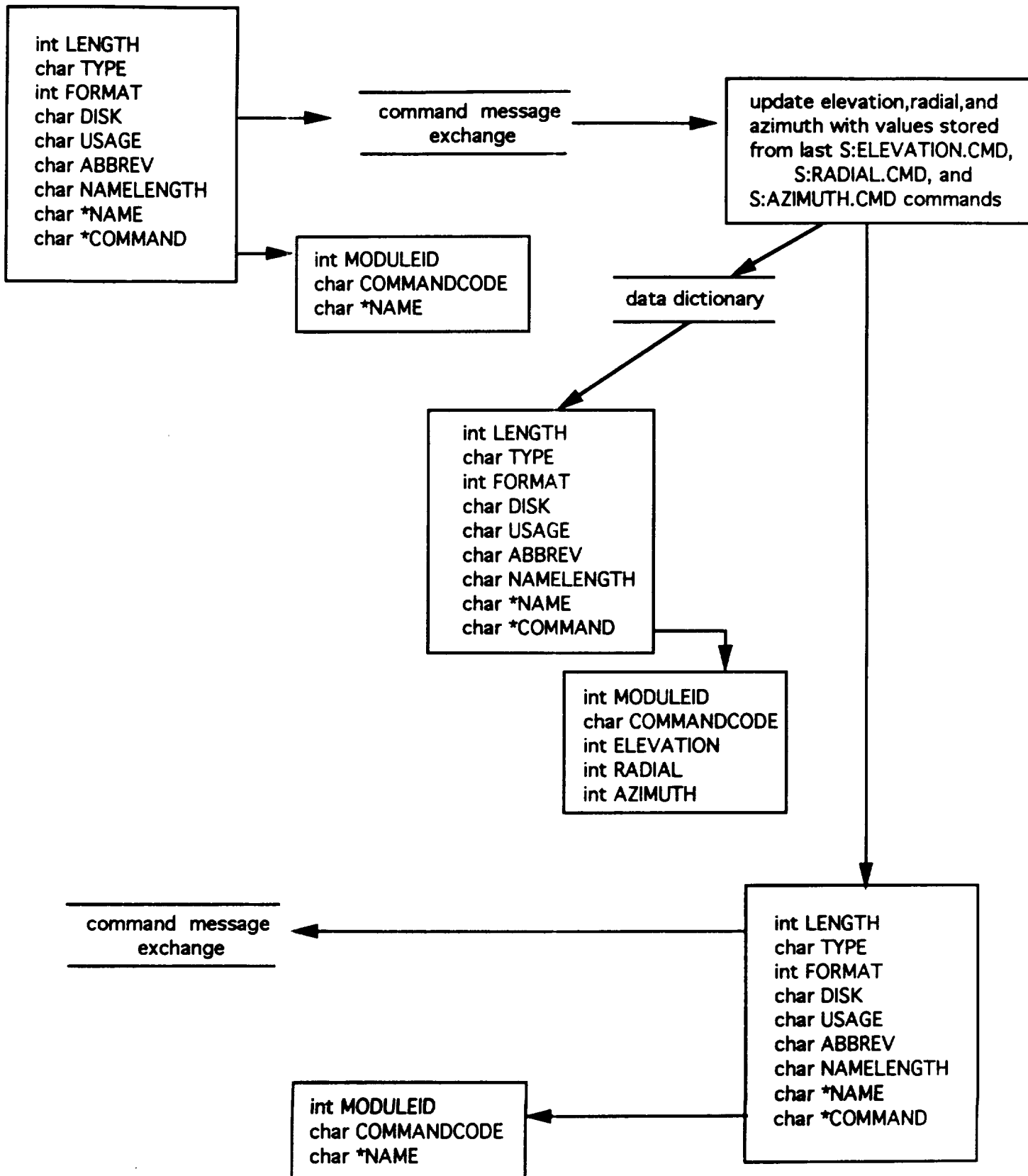
**COMMAND VARIABLE AZIMUTH POSITION
COMMANDCODE #52**



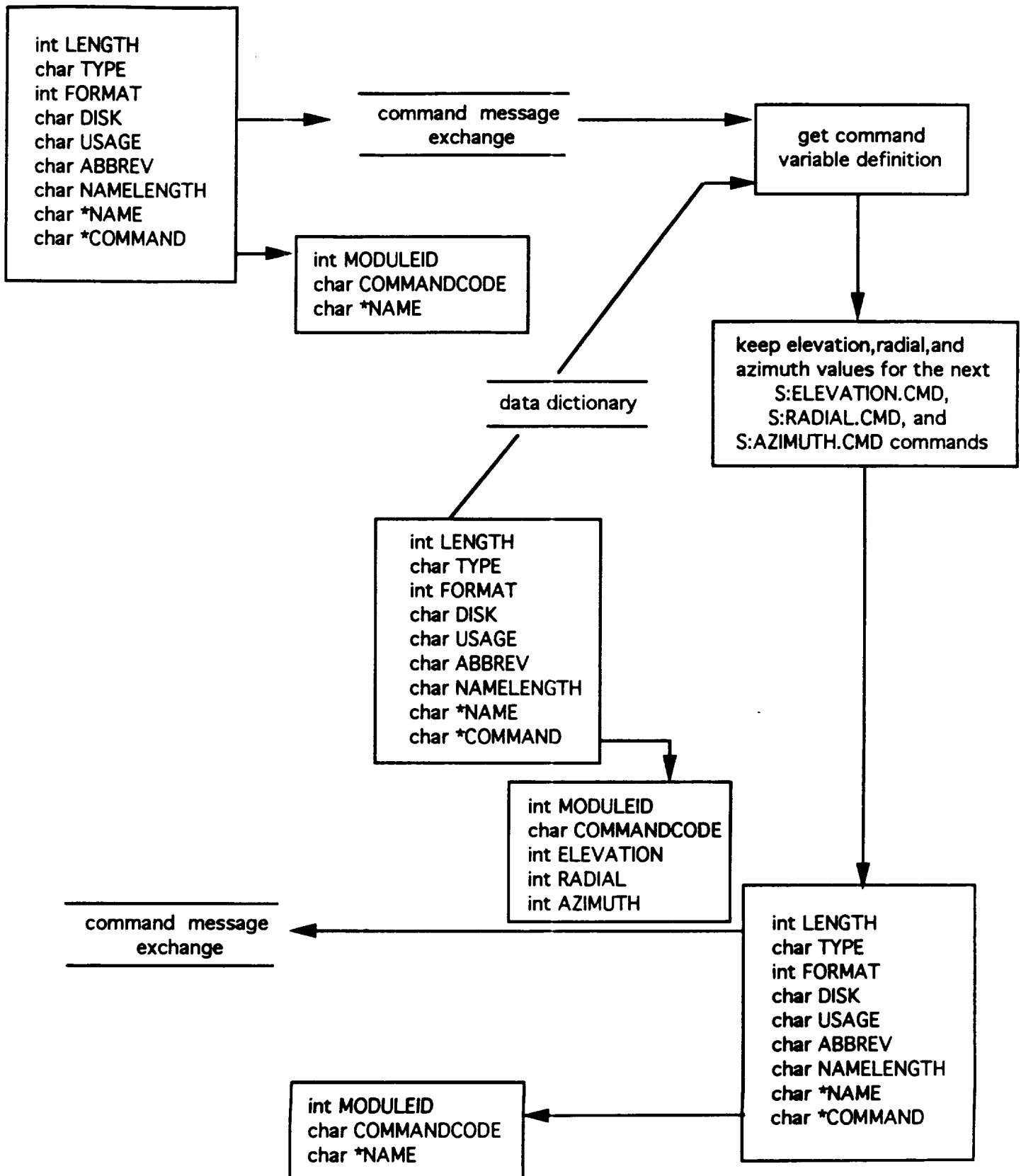
COMMAND VARIABLE GRIP POSITION
COMMANDCODE #53



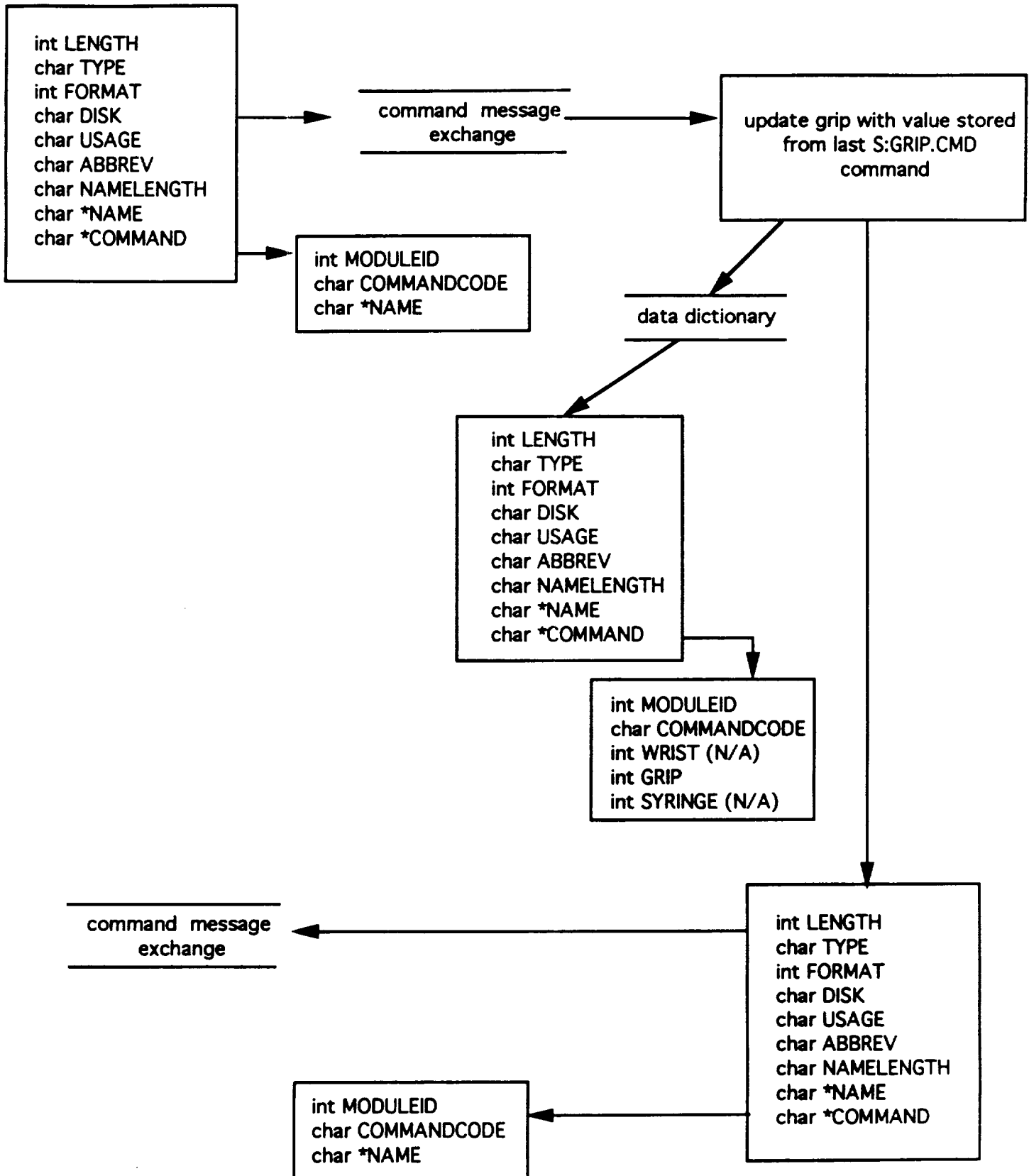
SET BASE COMMAND VARIABLE
COMMANDCODE #54



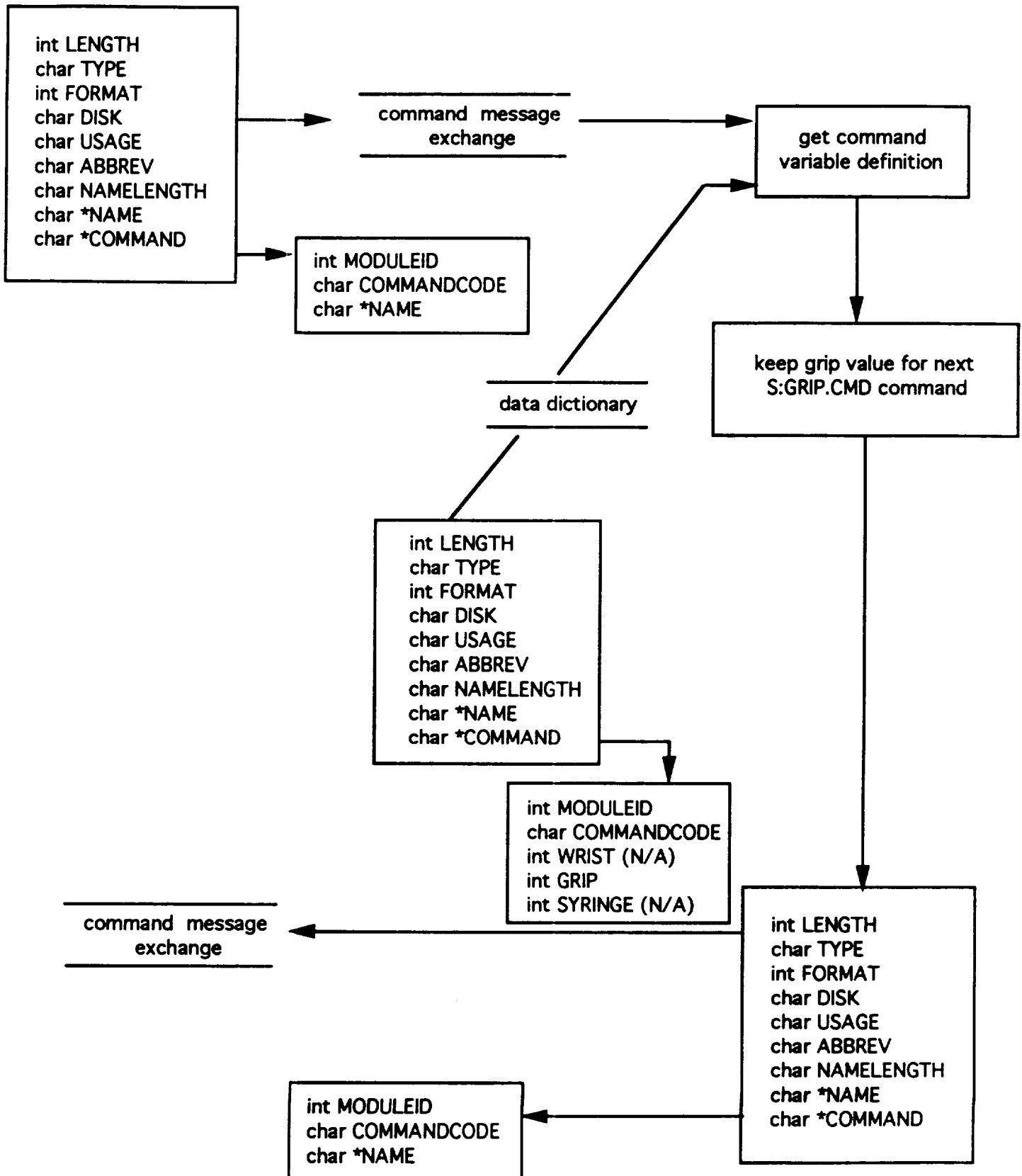
GET BASE COMMAND VARIABLE COMMANDCODE #55



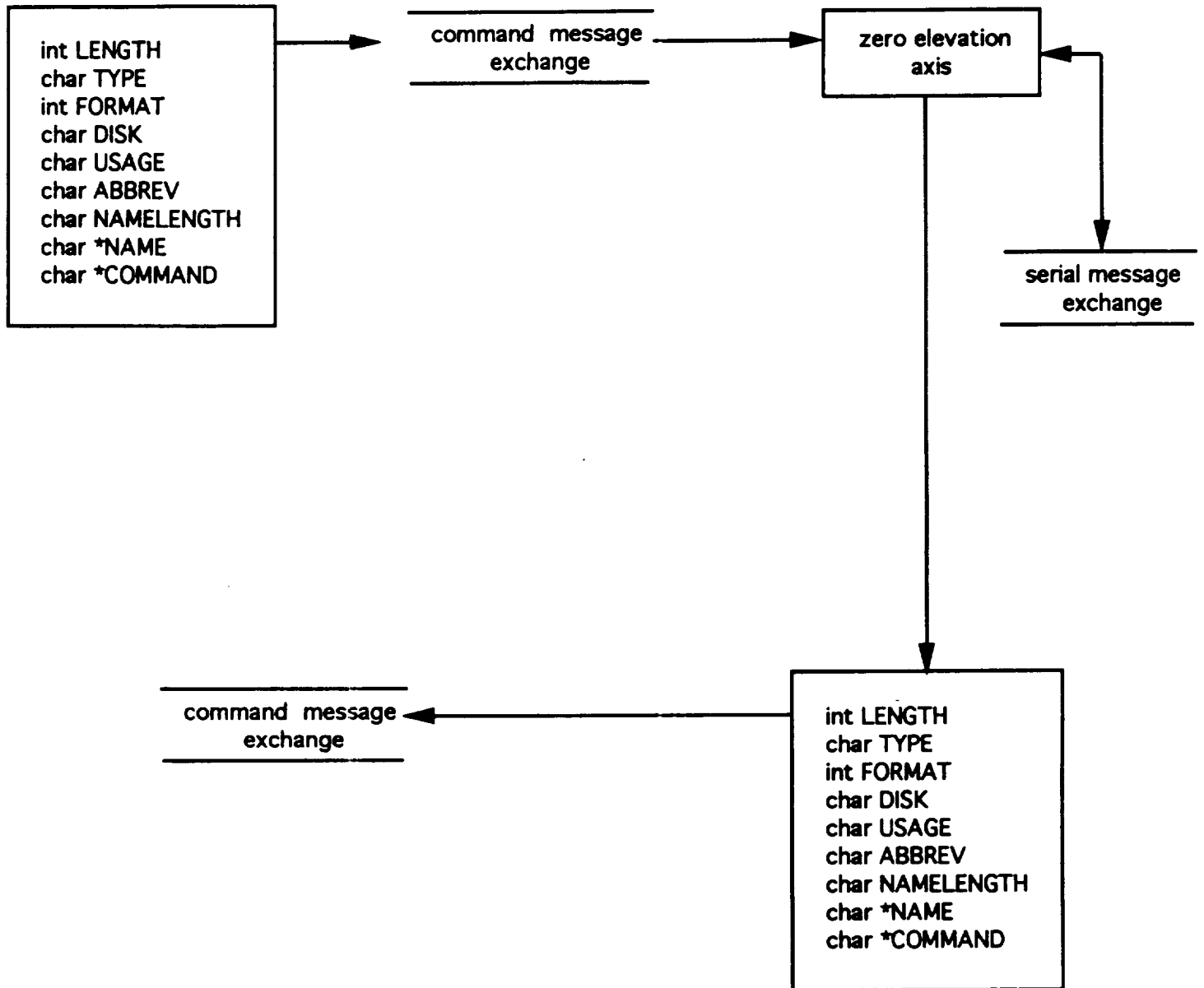
SET HAND COMMAND VARIABLE
COMMANDCODE #56



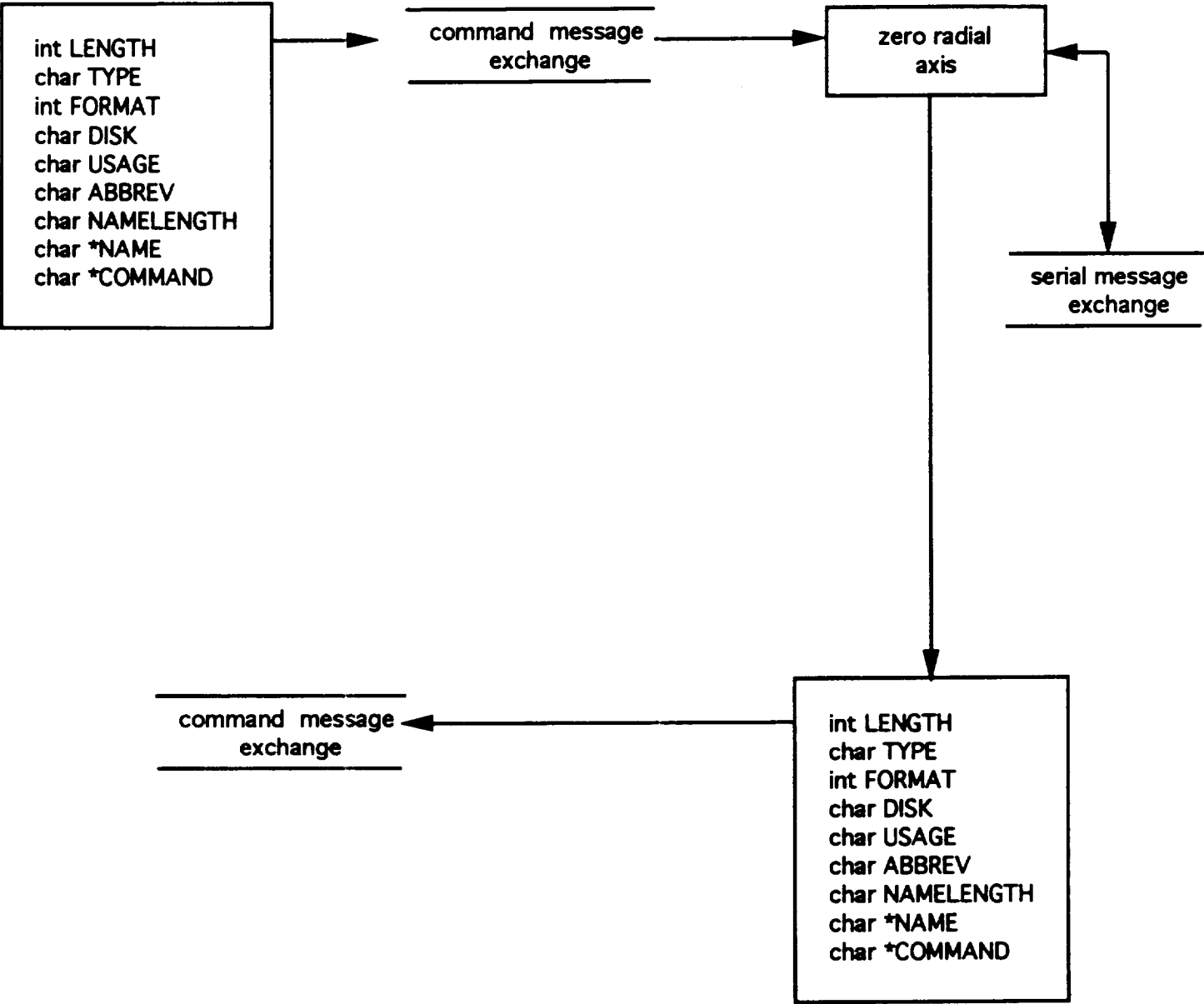
GET HAND COMMAND VARIABLE COMMANDCODE #57



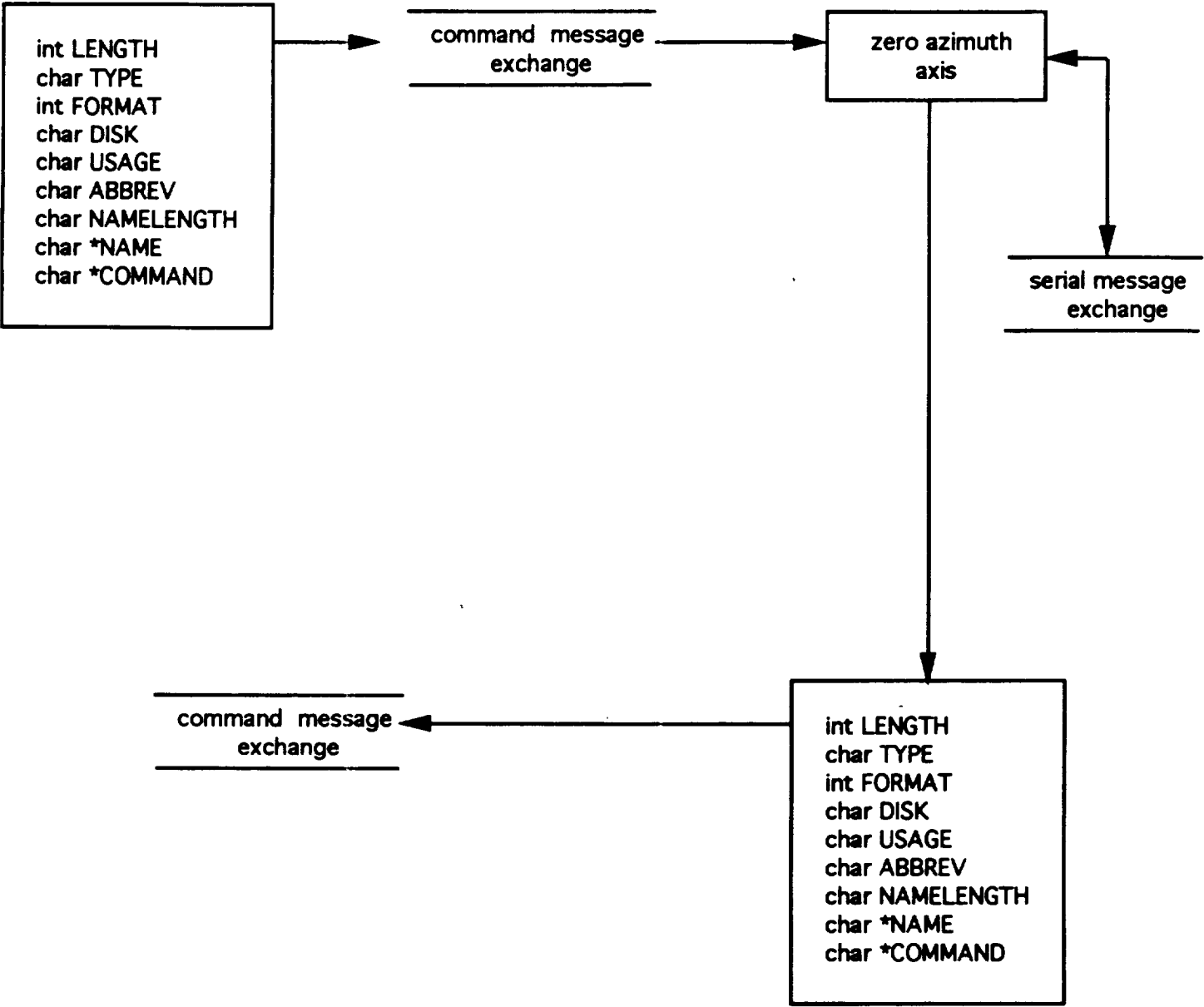
**ZERO ELEVATION AXIS
COMMANDCODE #58**



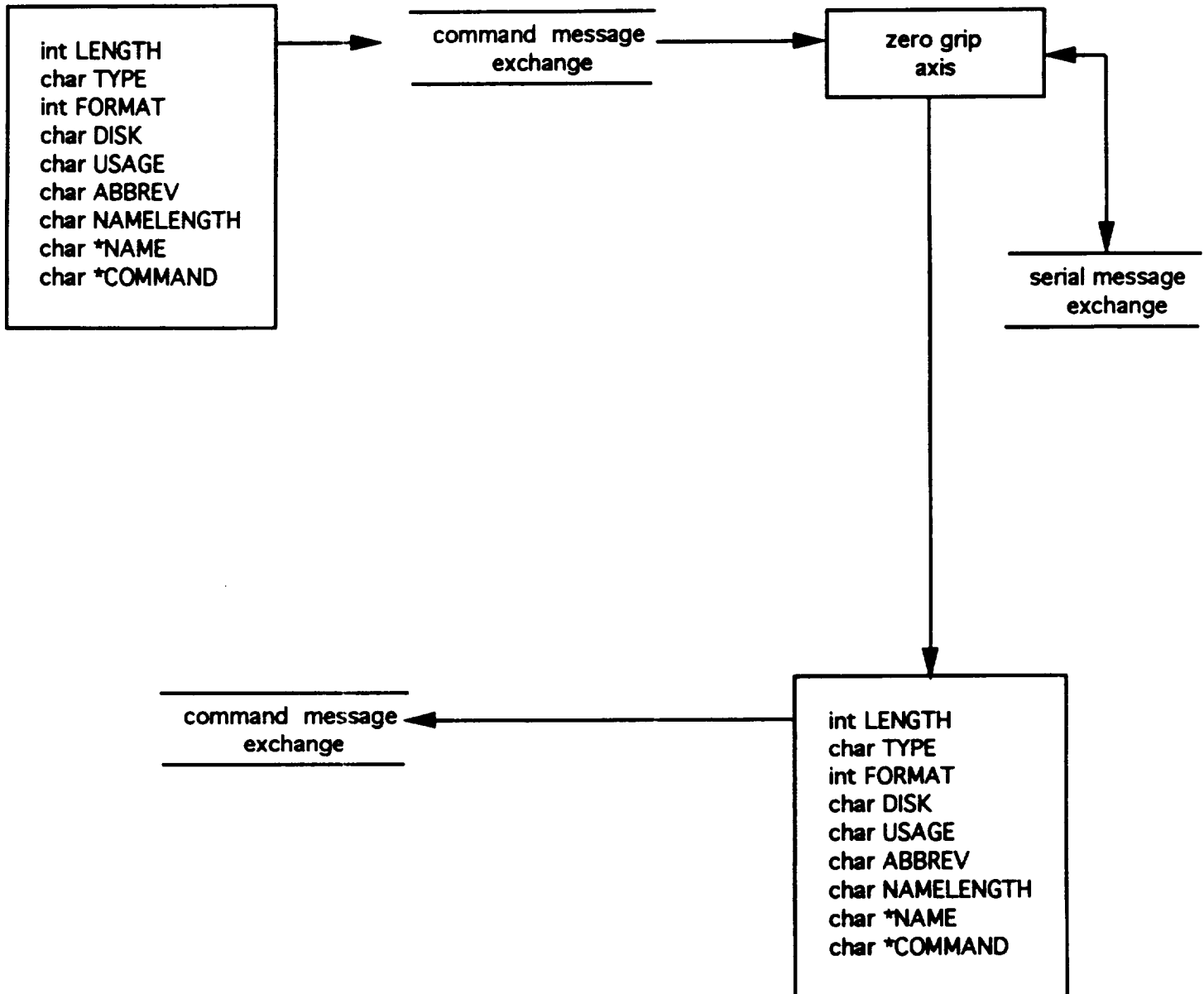
ZERO RADIAL AXIS
COMMANDCODE #59



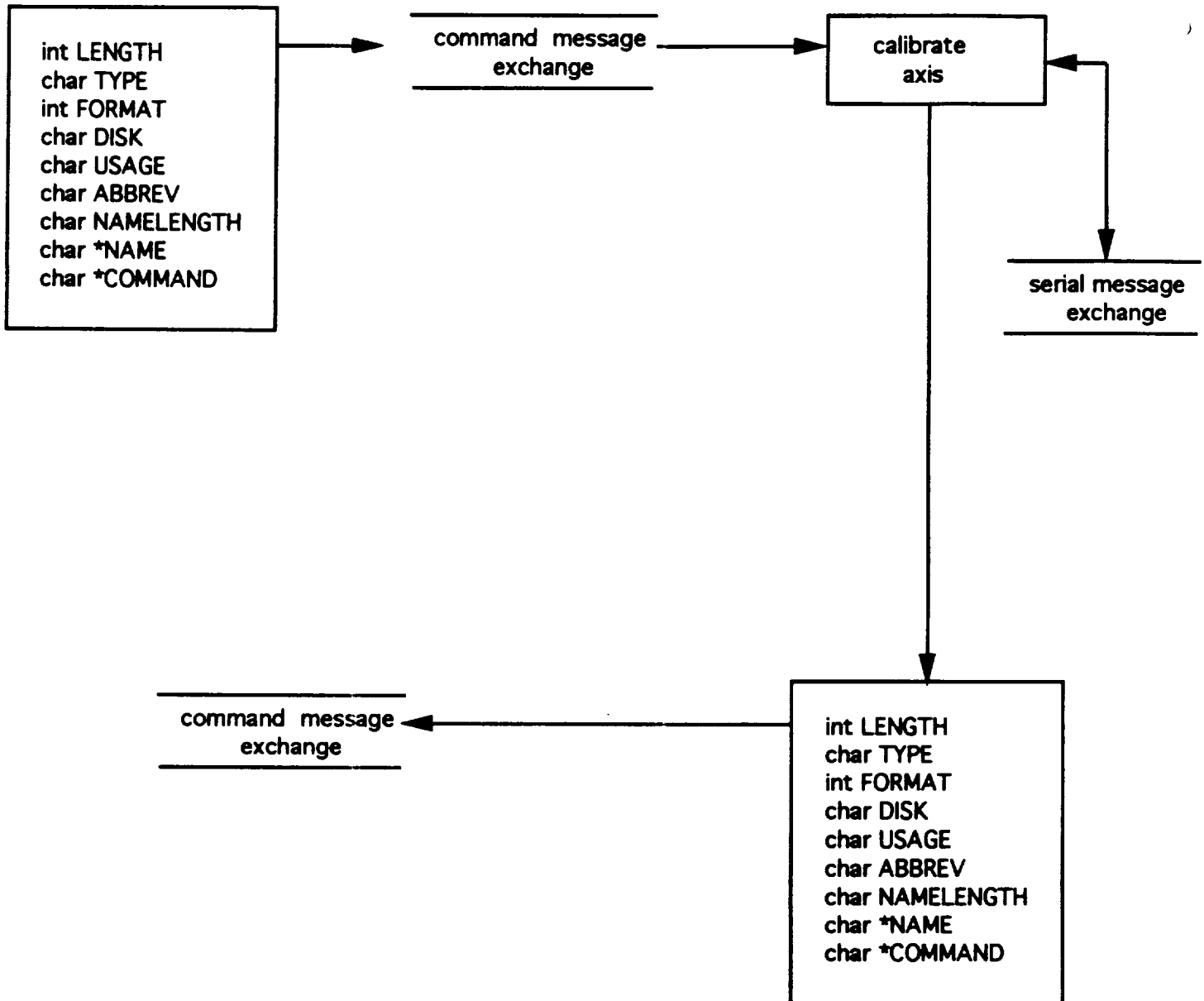
ZERO AZIMUTH AXIS
COMMANDCODE #60



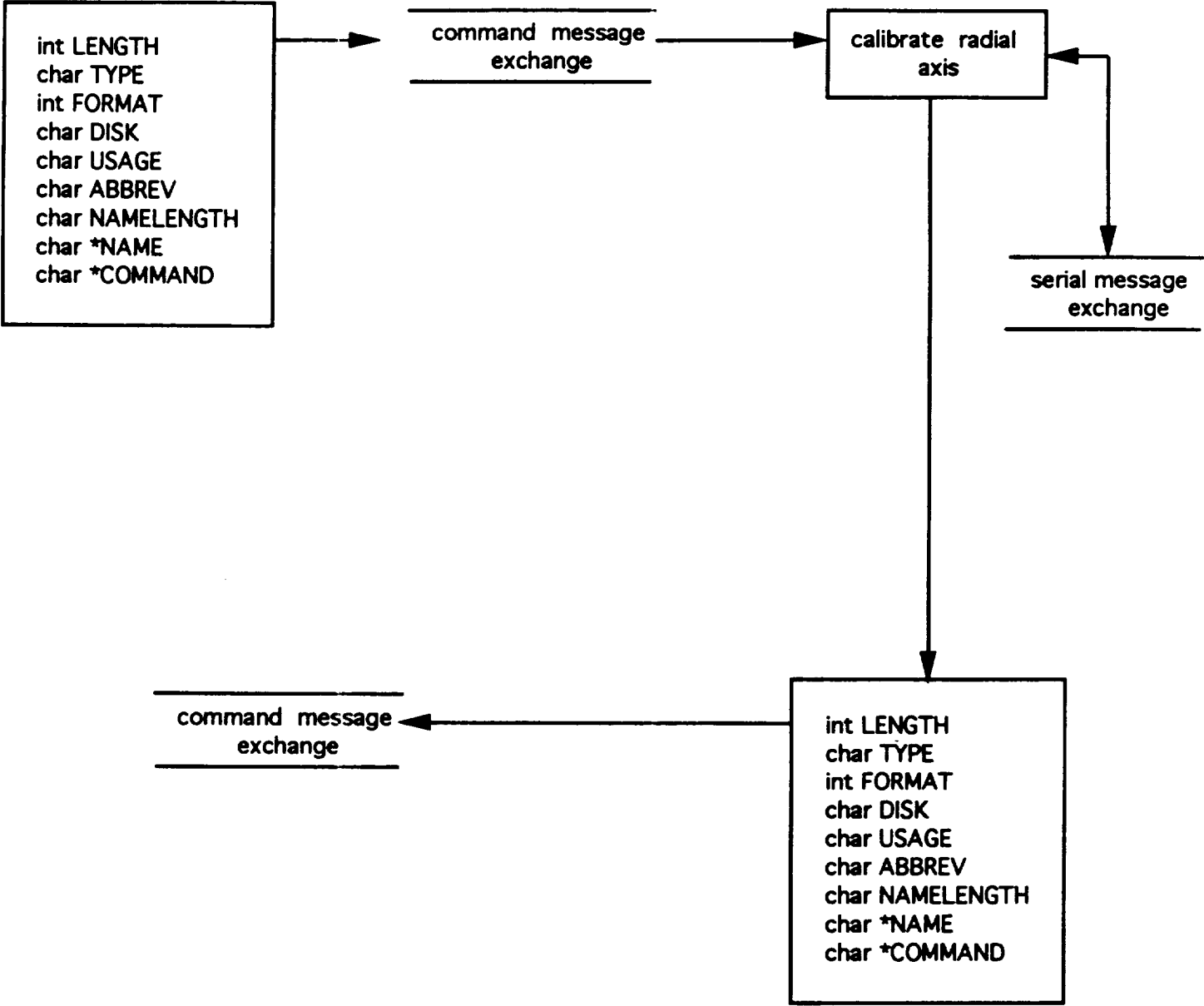
**ZERO GRIP AXIS
COMMANDCODE #61**



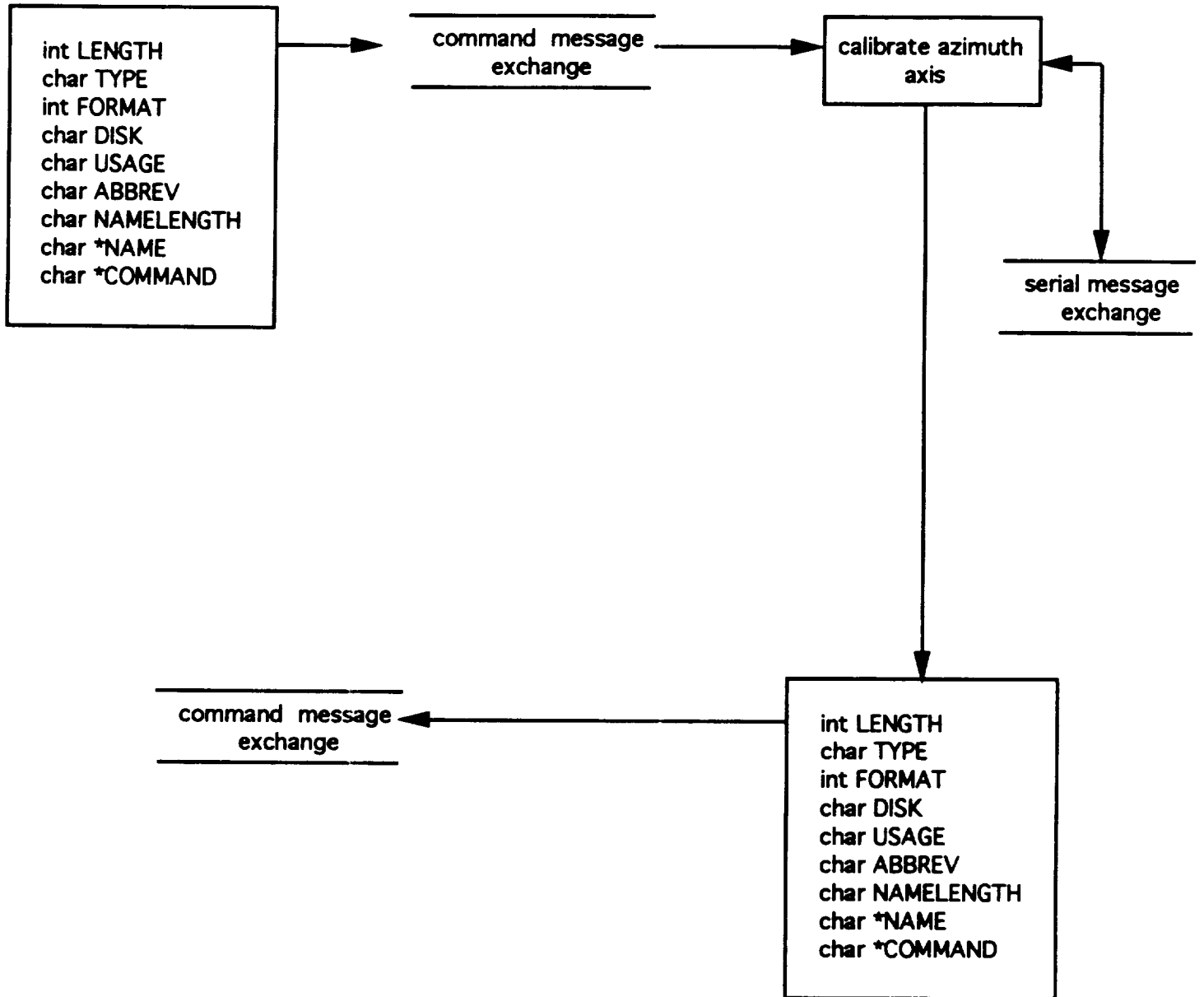
**CALIBRATE ELEVATION AXIS
COMMANDCODE #62**



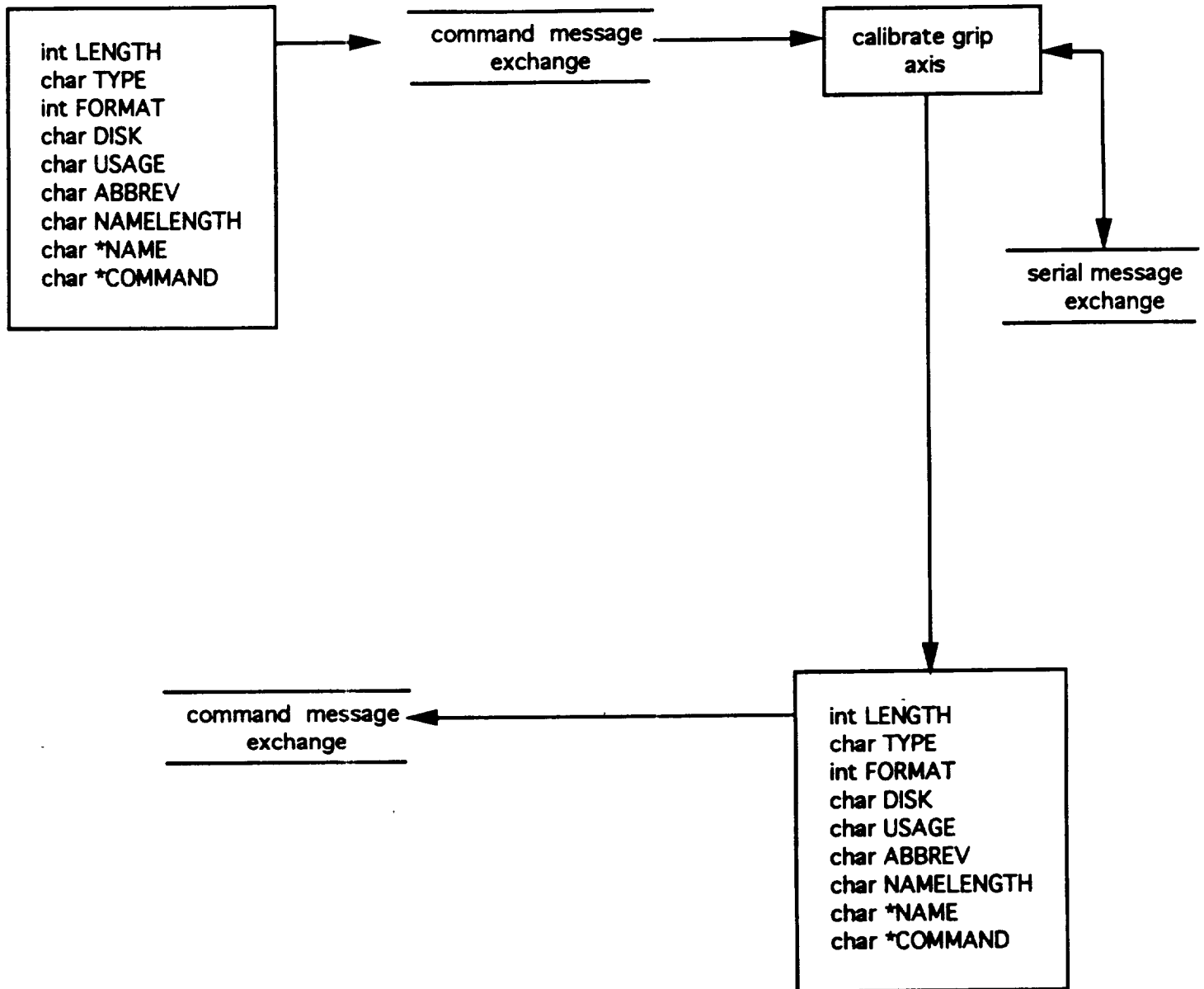
CALIBRATE RADIAL AXIS
COMMANDCODE #63



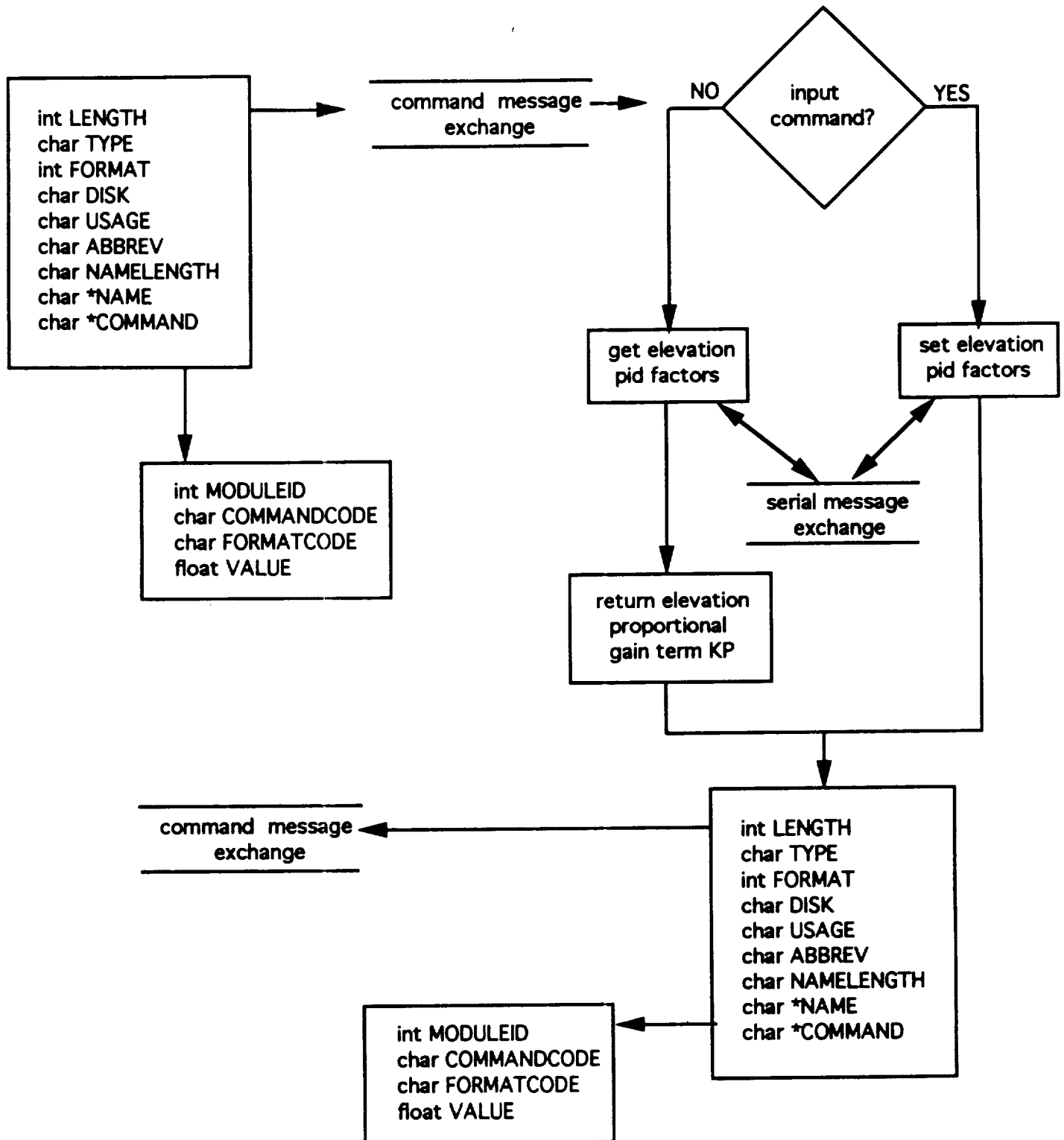
CALIBRATE AZIMUTH AXIS COMMANDCODE #64



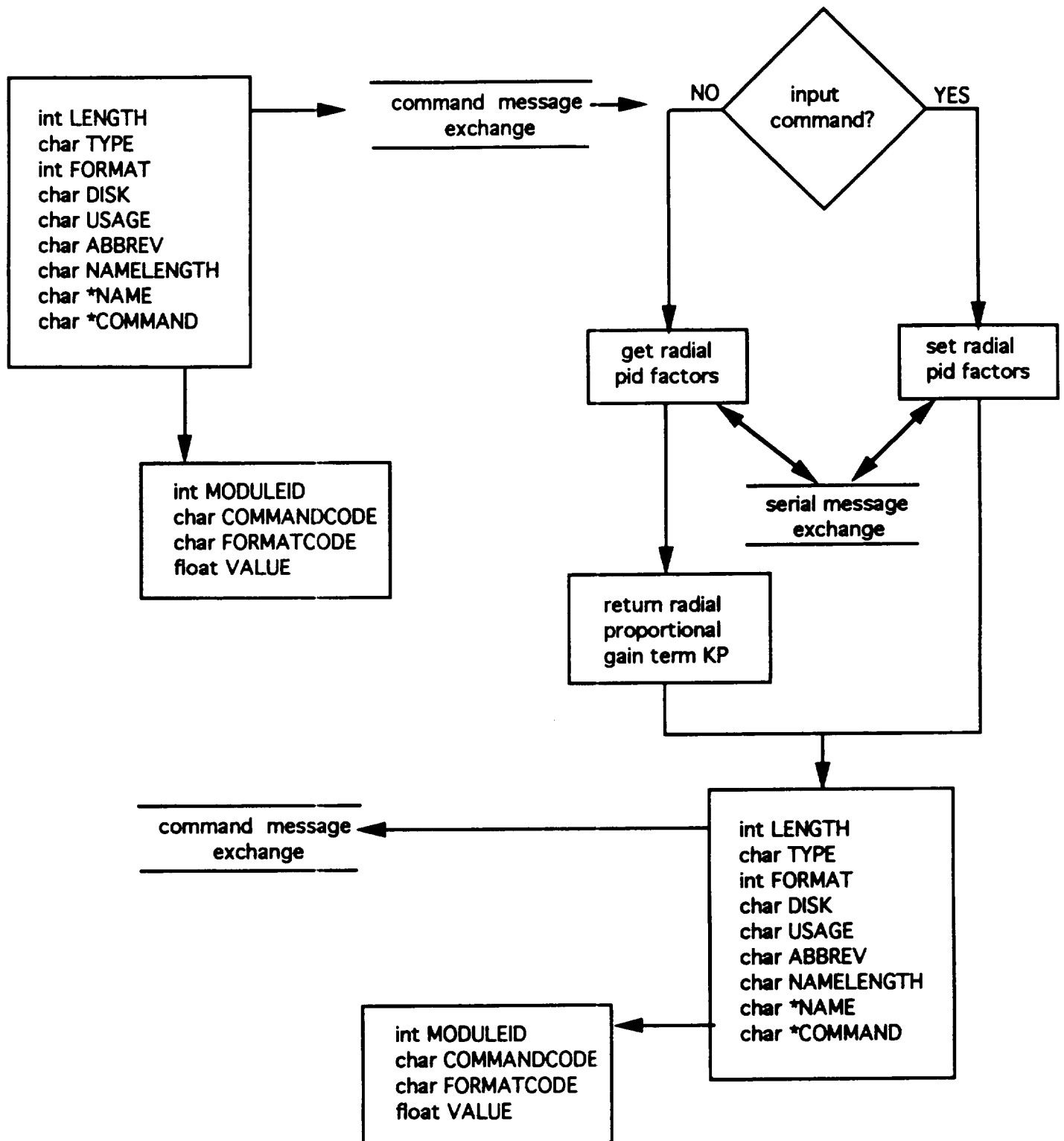
CALIBRATE GRIP AXIS
COMMANDCODE #65



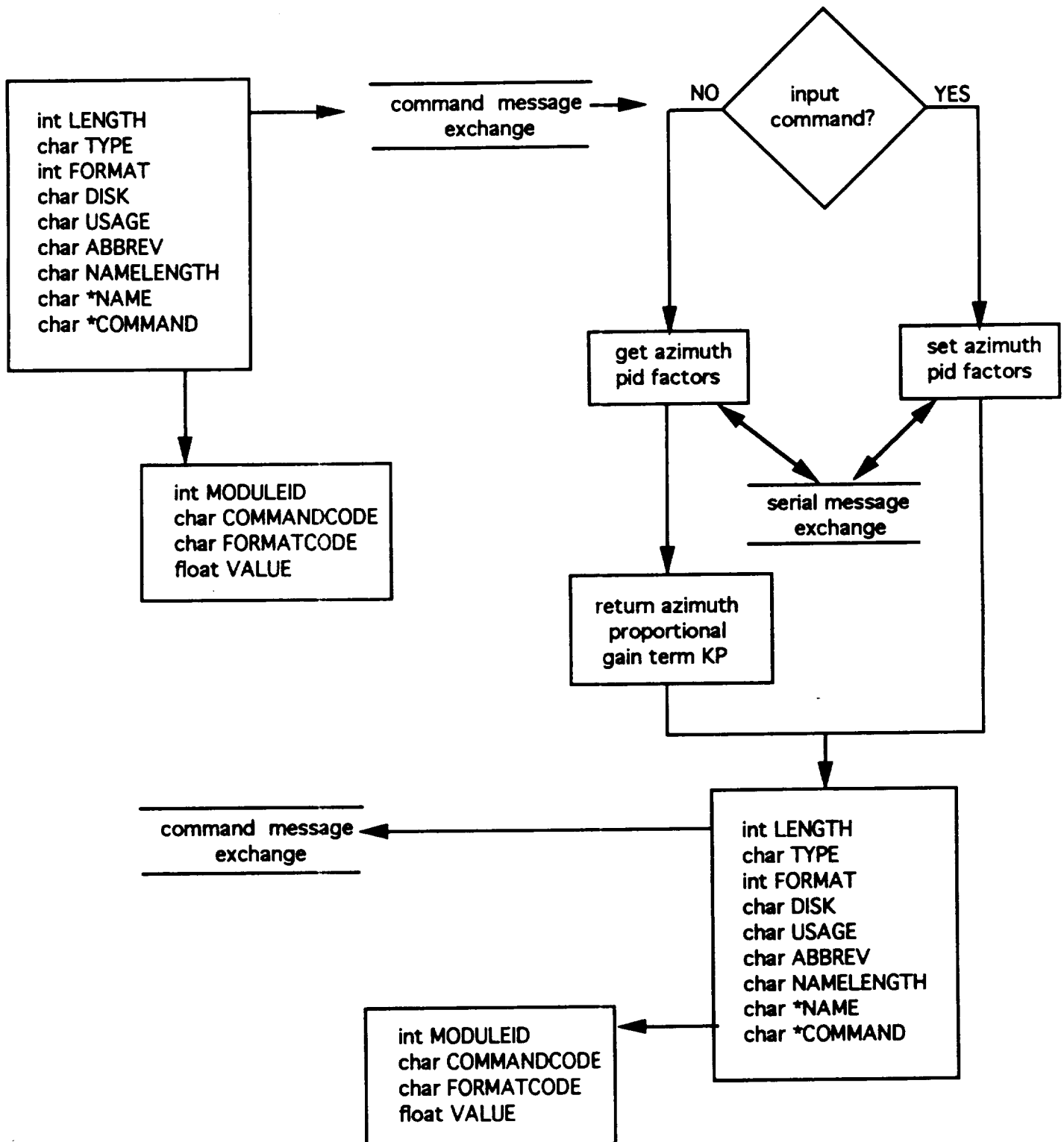
ELEVATION PROPORTIONAL GAIN COMMAND COMMANDCODE #66



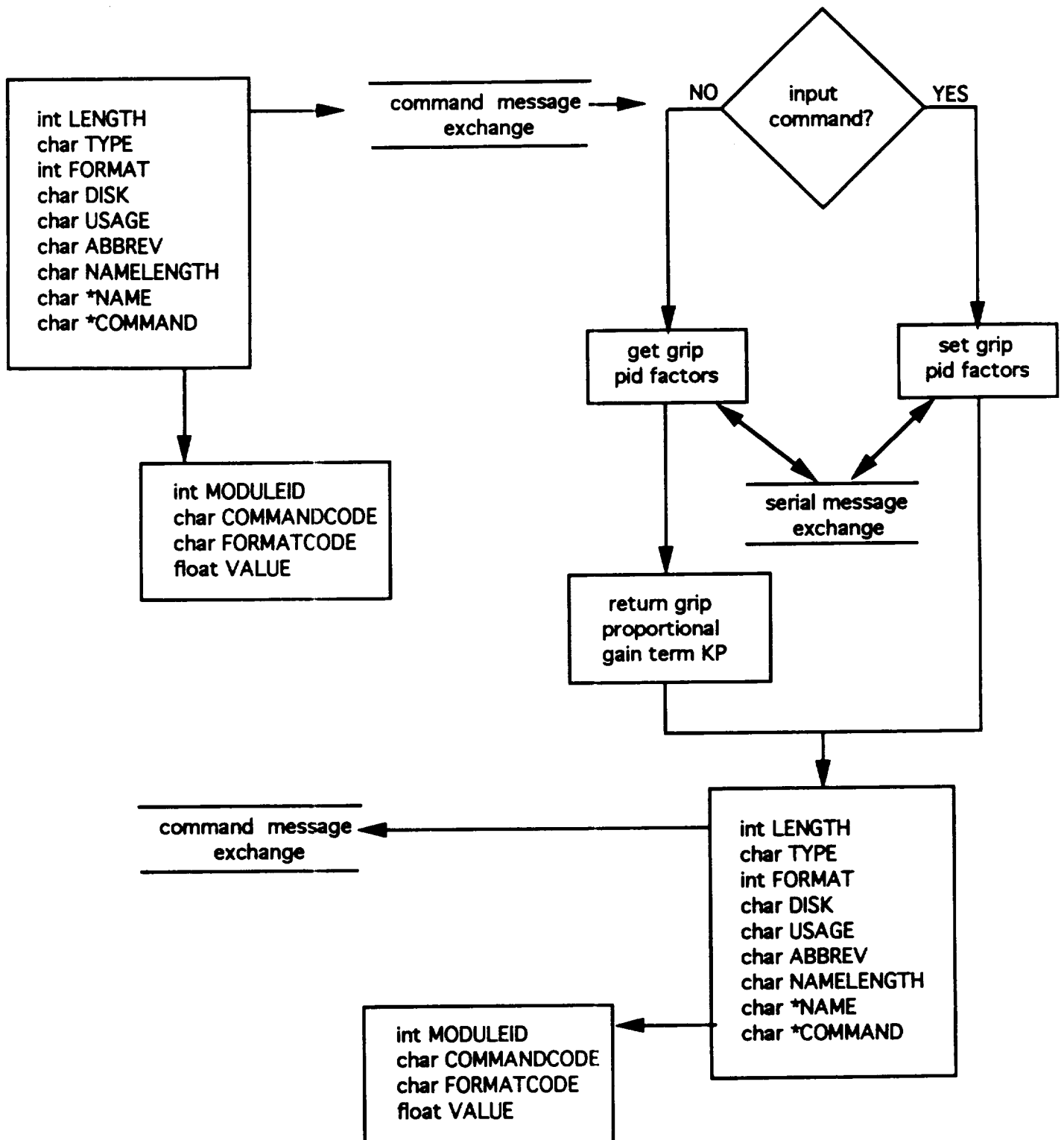
**RADIAL PROPORTIONAL GAIN COMMAND
COMMANDCODE #67**



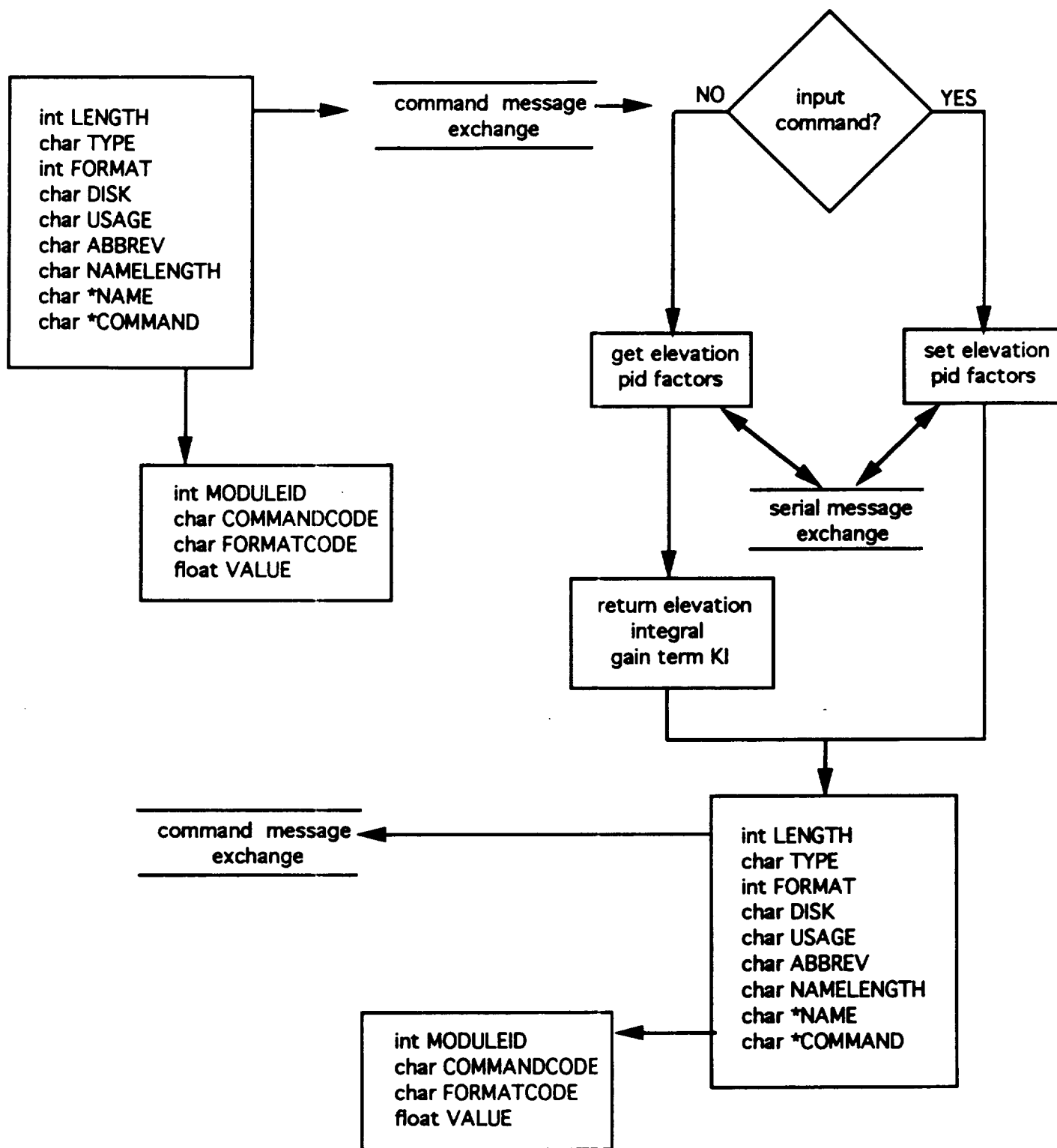
**AZIMUTH PROPORTIONAL GAIN COMMAND
COMMANDCODE #68**



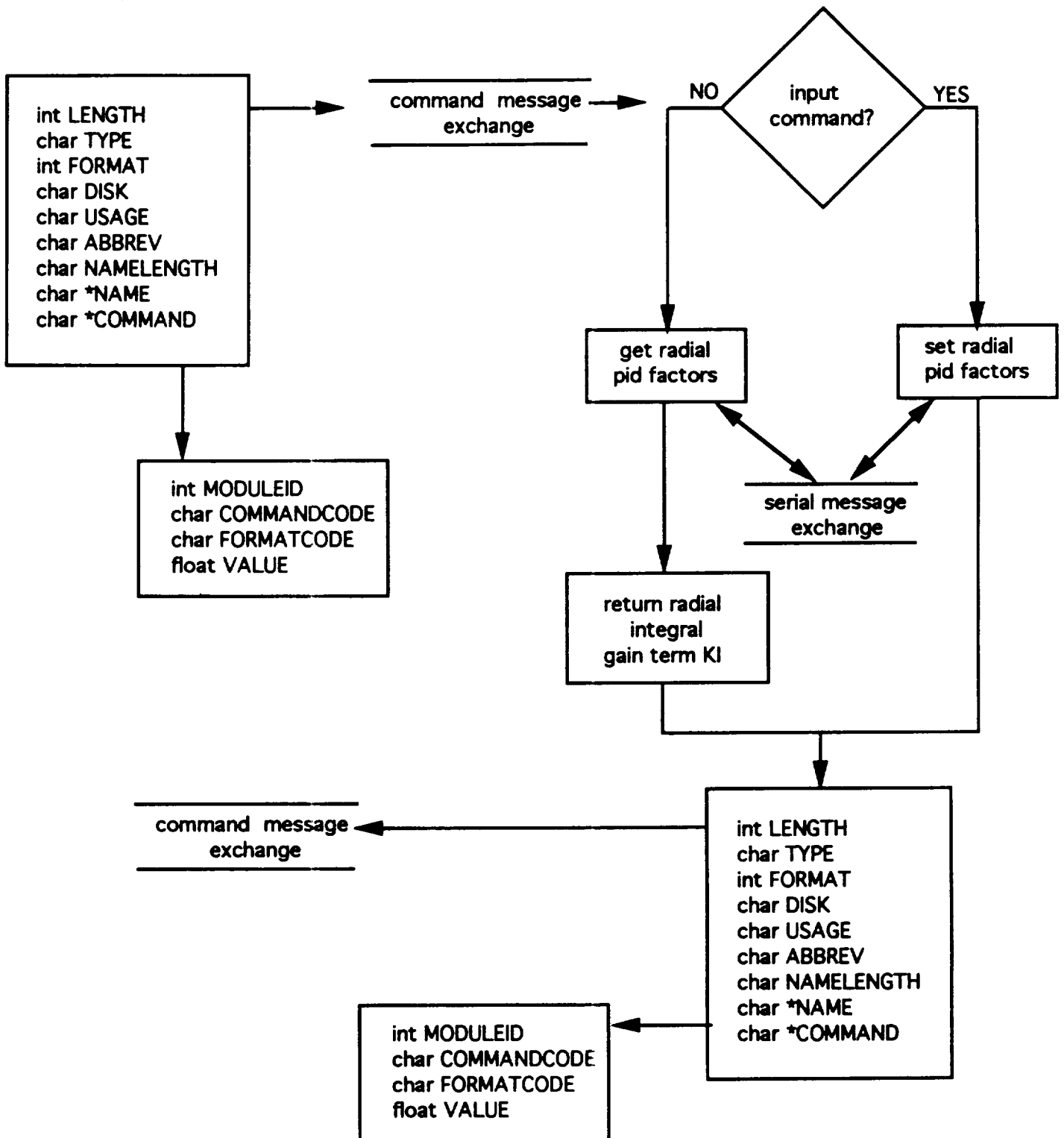
GRIP PROPORTIONAL GAIN COMMAND COMMANDCODE #69



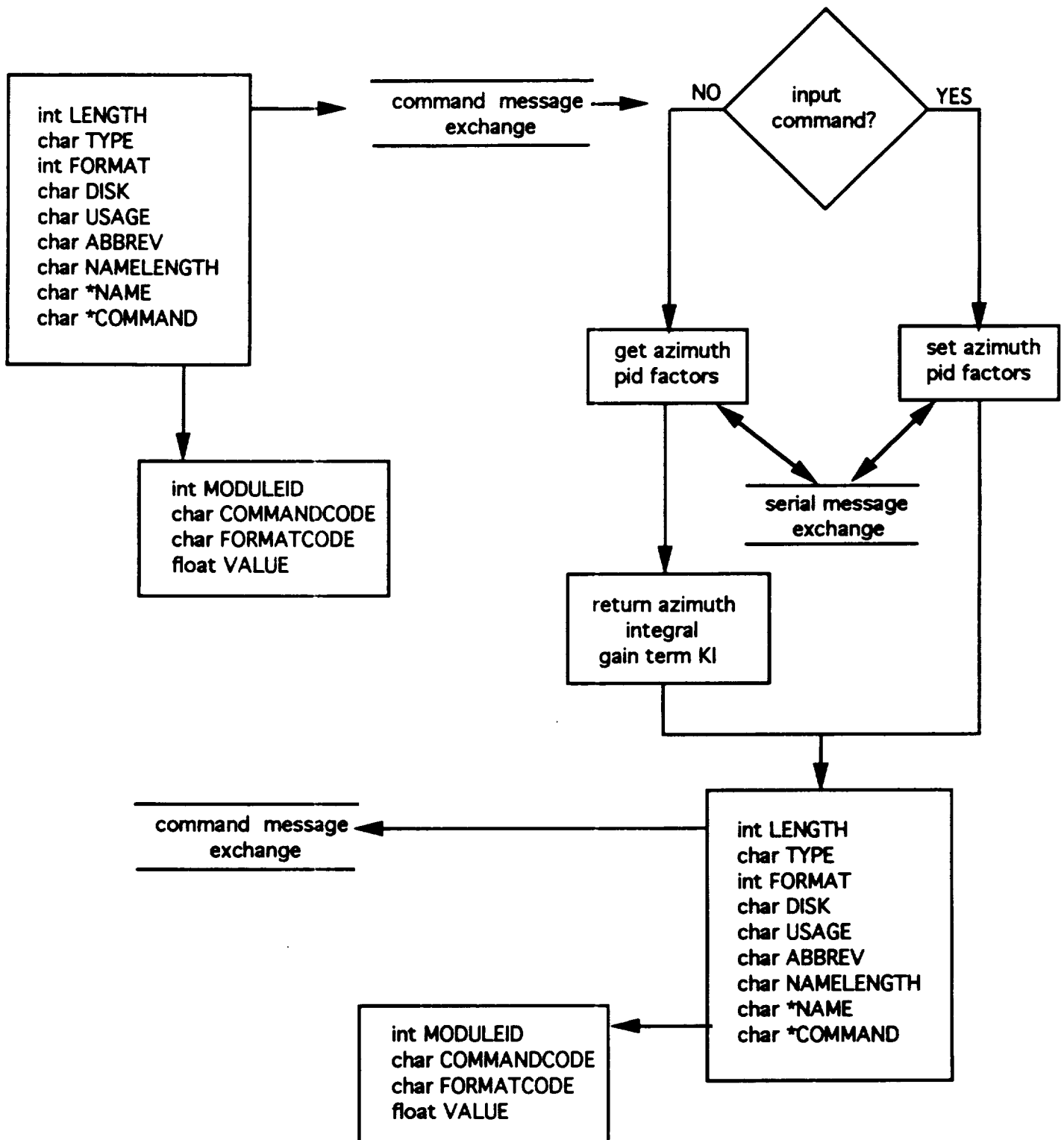
ELEVATION INTEGRAL GAIN COMMAND
COMMANDCODE #70



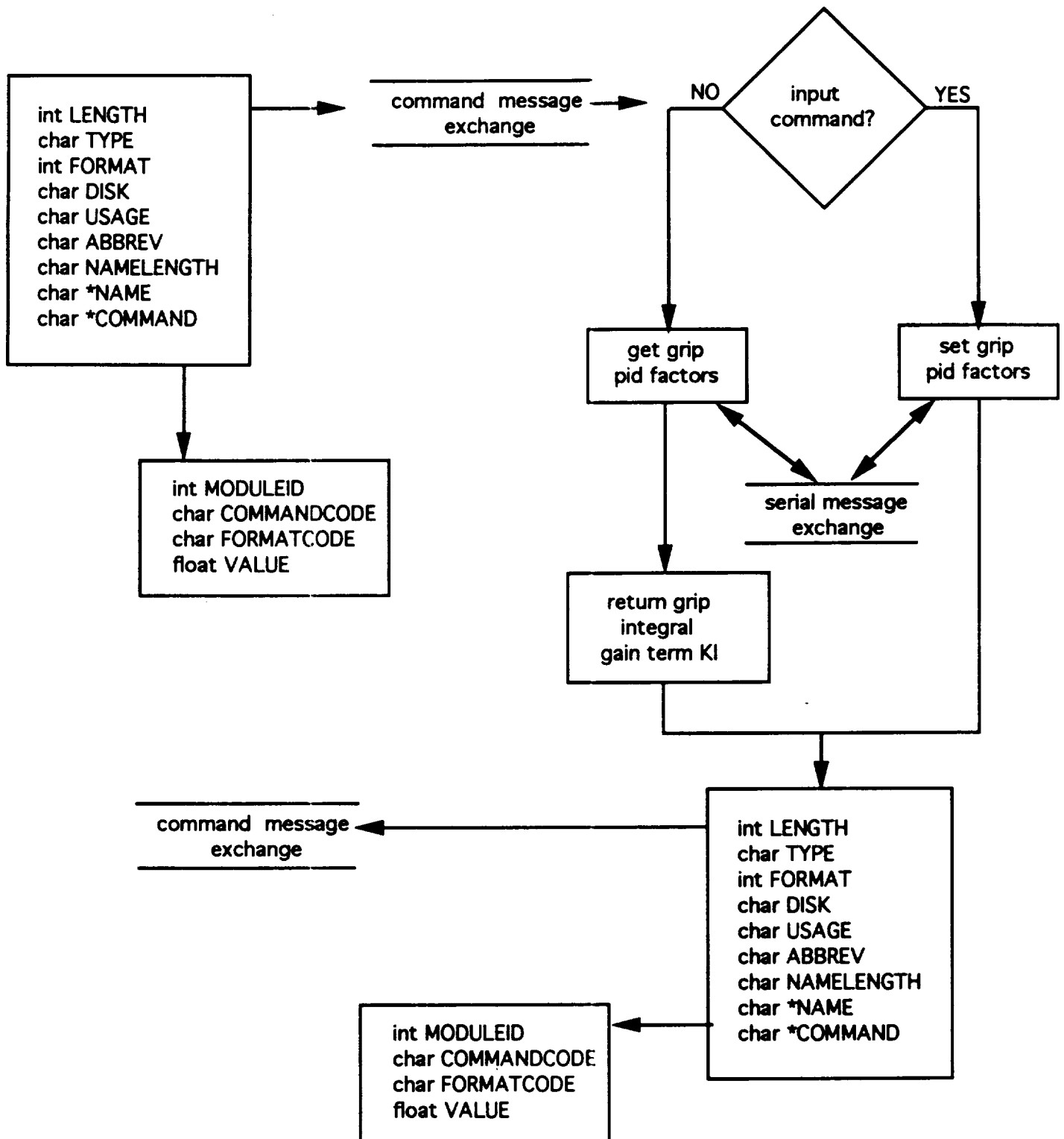
RADIAL INTEGRAL GAIN COMMAND
COMMANDCODE #71



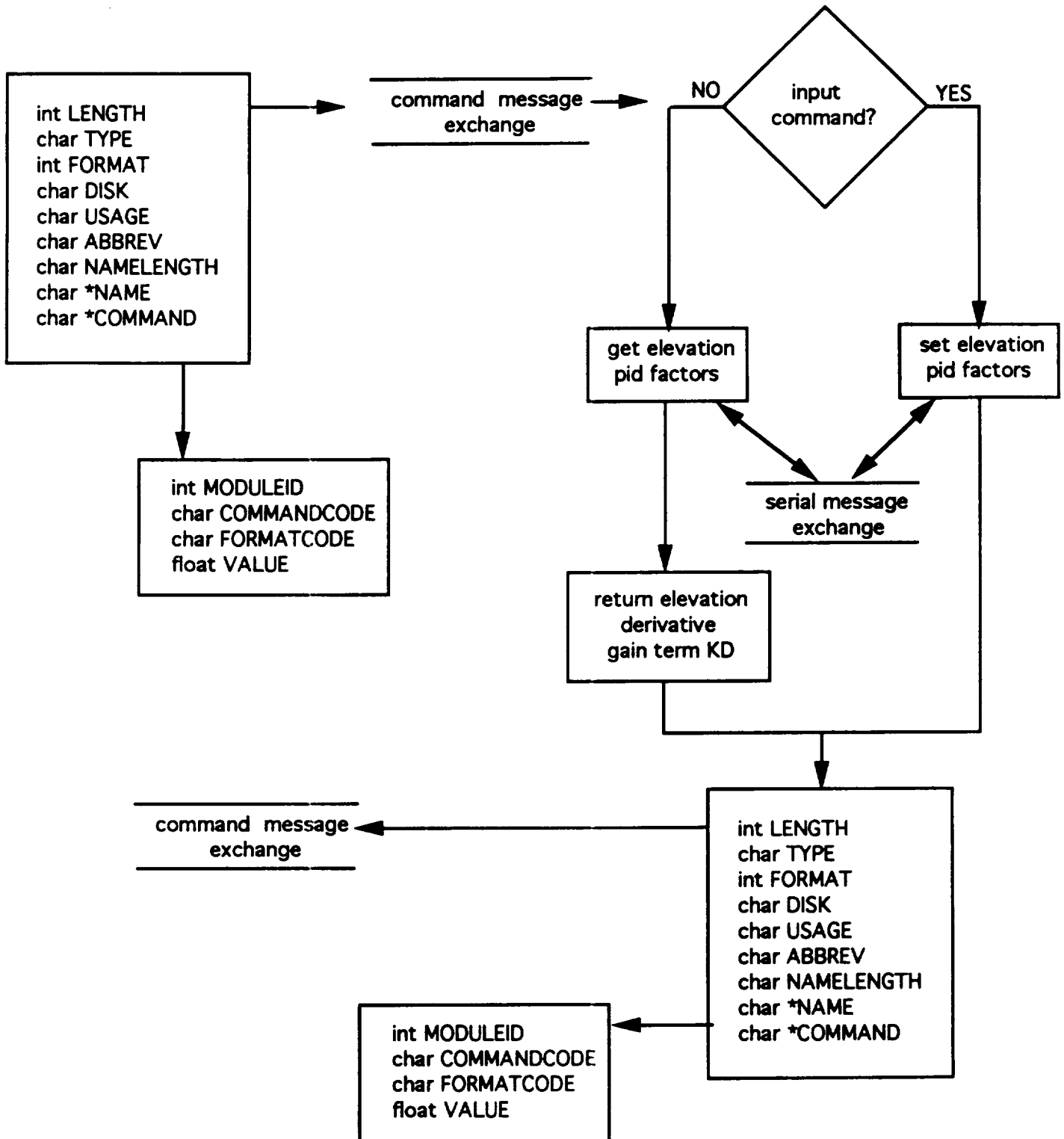
**AZIMUTH INTEGRAL GAIN COMMAND
COMMANDCODE #72**



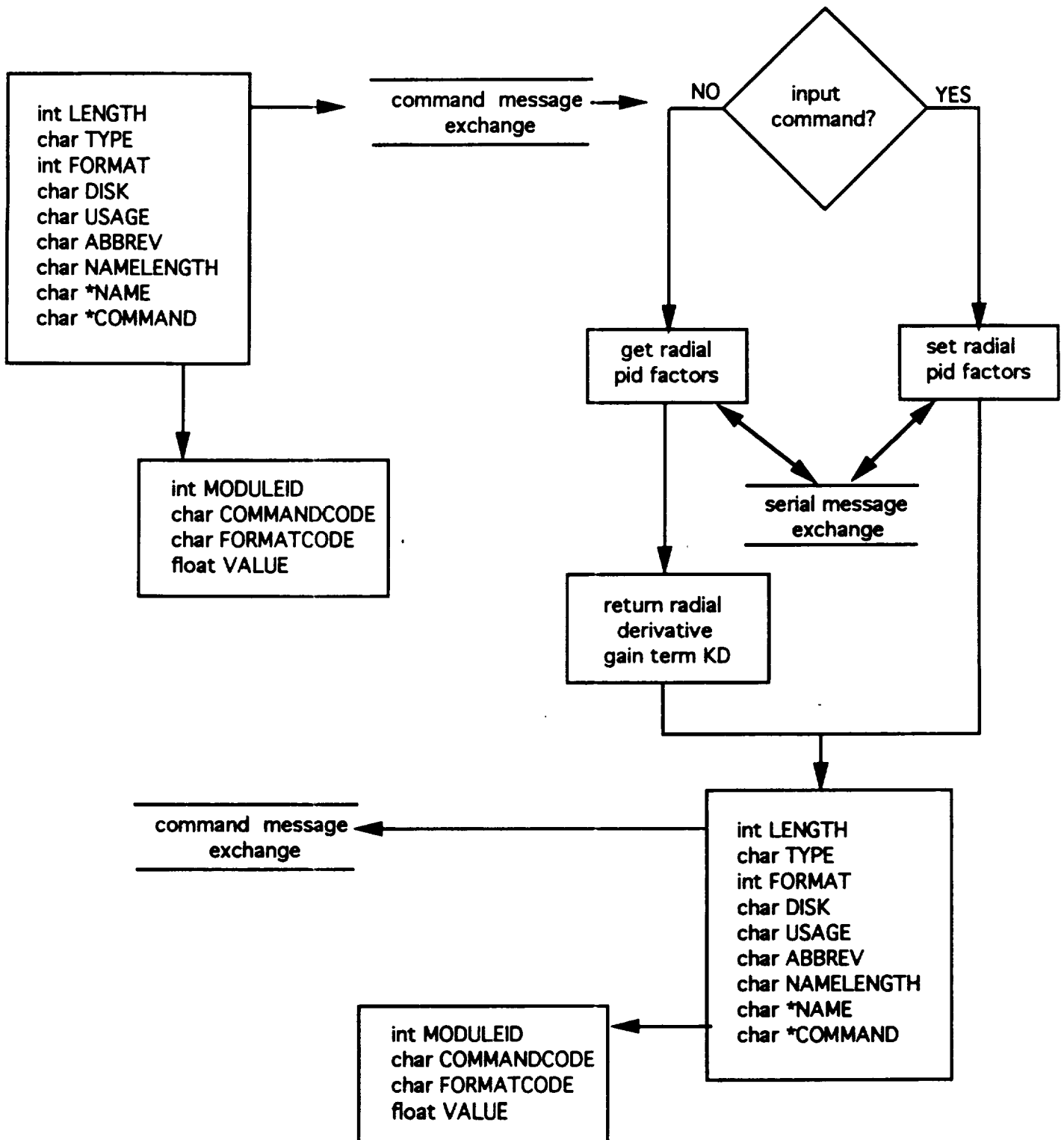
GRIP INTEGRAL GAIN COMMAND COMMANDCODE #73



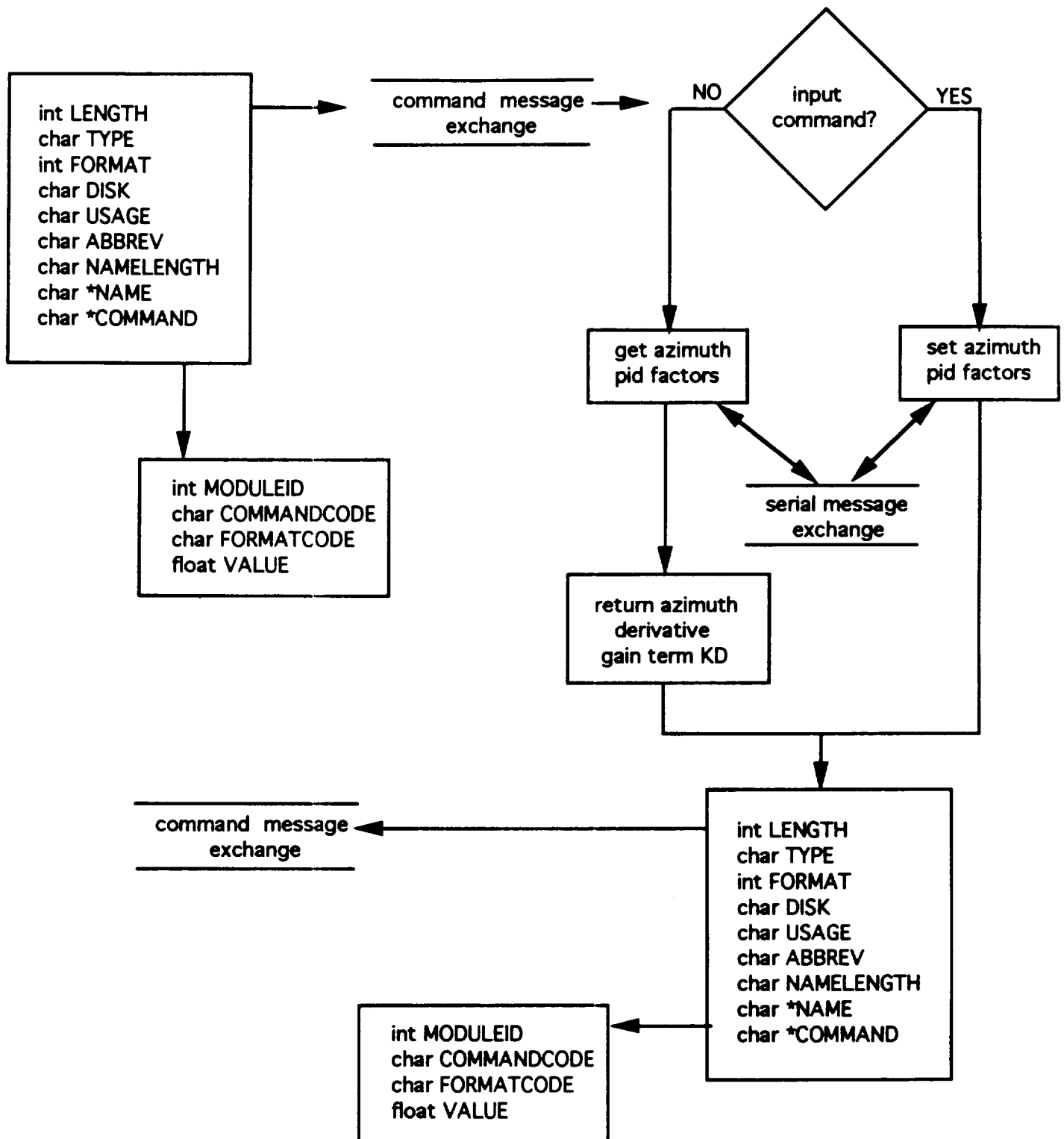
ELEVATION DERIVATIVE GAIN COMMAND COMMANDCODE #74



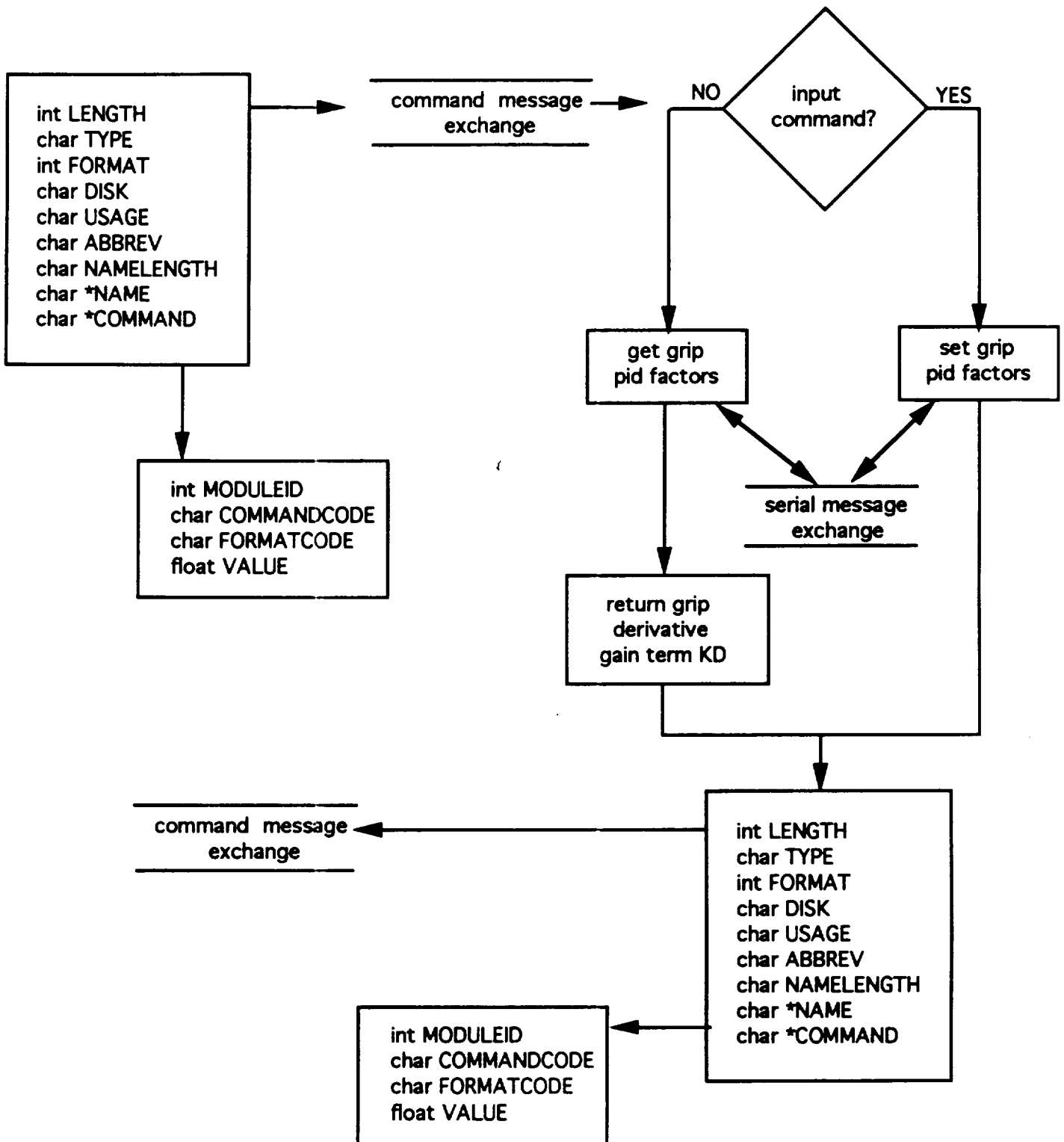
RADIAL DERIVATIVE GAIN COMMAND COMMANDCODE #75



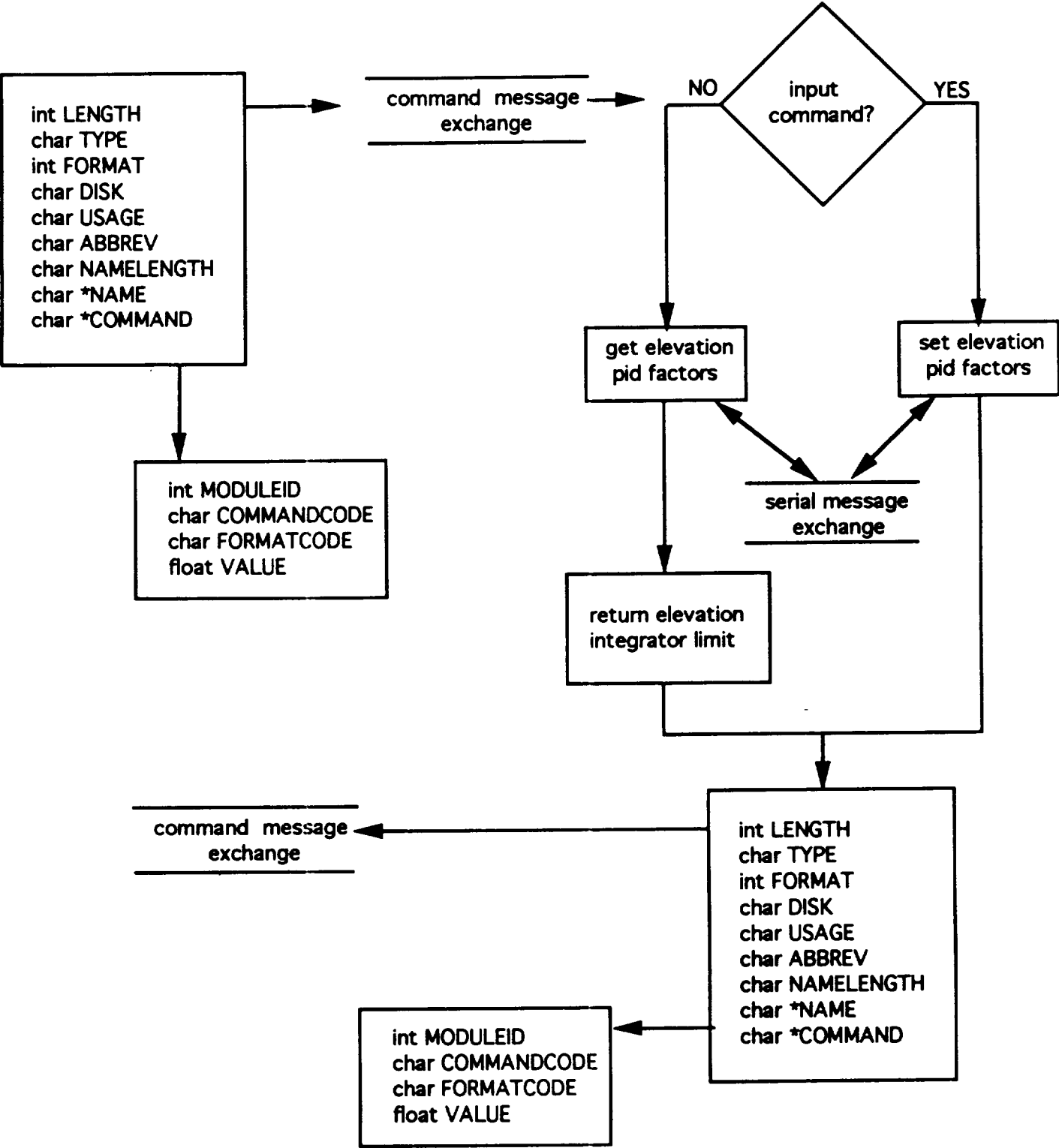
**AZIMUTH DERIVATIVE GAIN COMMAND
COMMANDCODE #76**



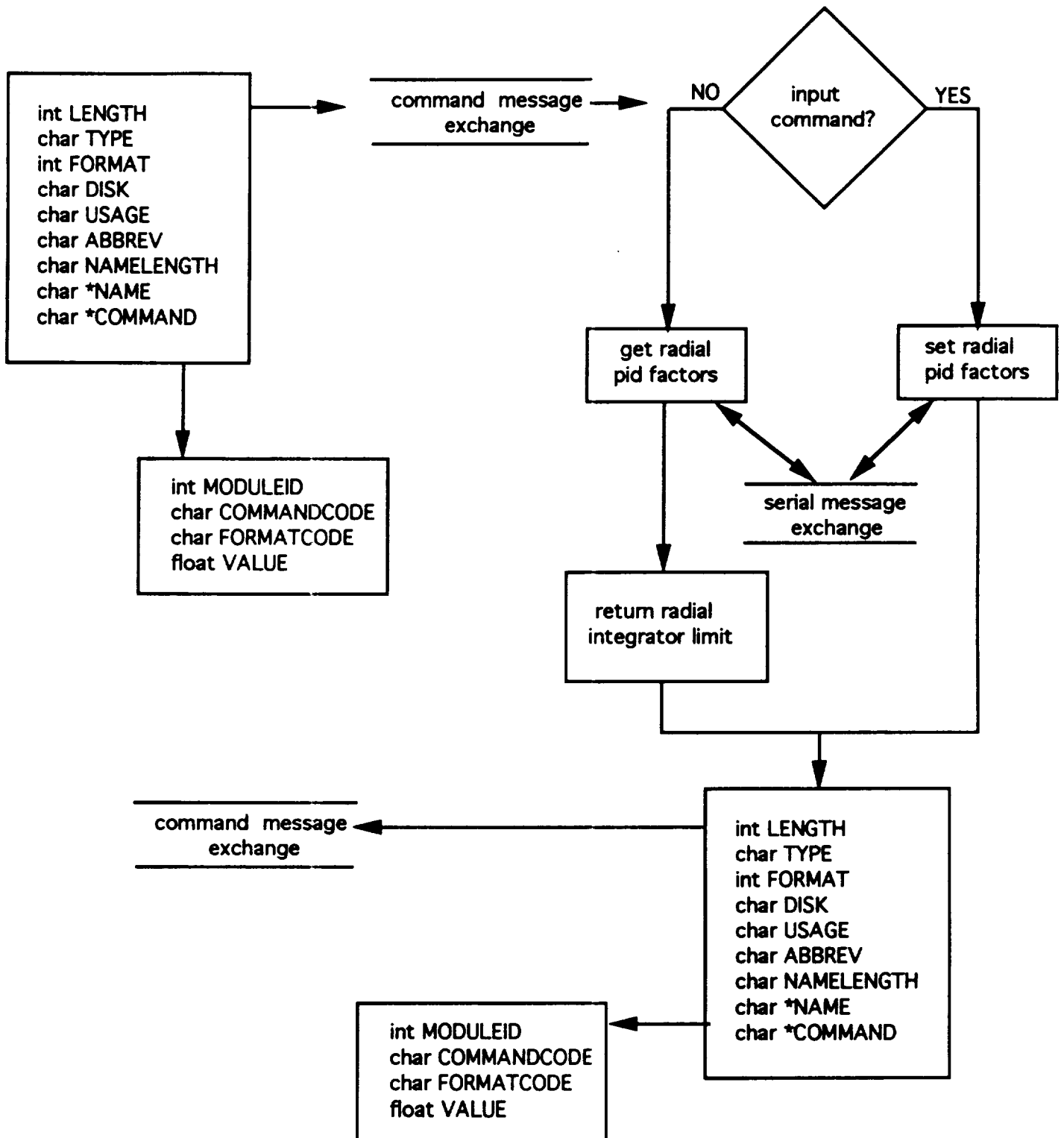
GRIP DERIVATIVE GAIN COMMAND
COMMANDCODE #77



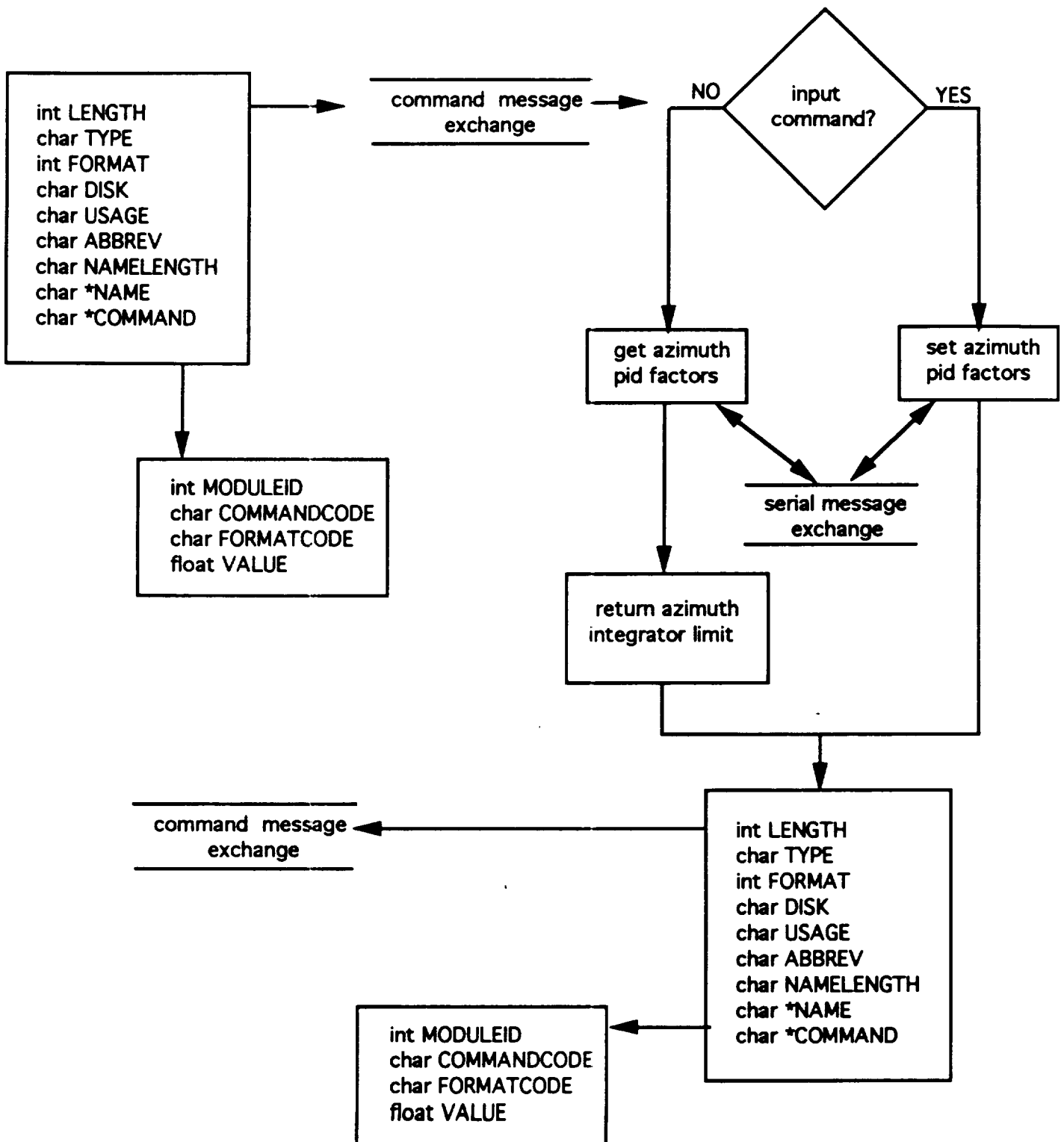
ELEVATION INTEGRATOR LIMIT COMMAND
COMMANDCODE #78



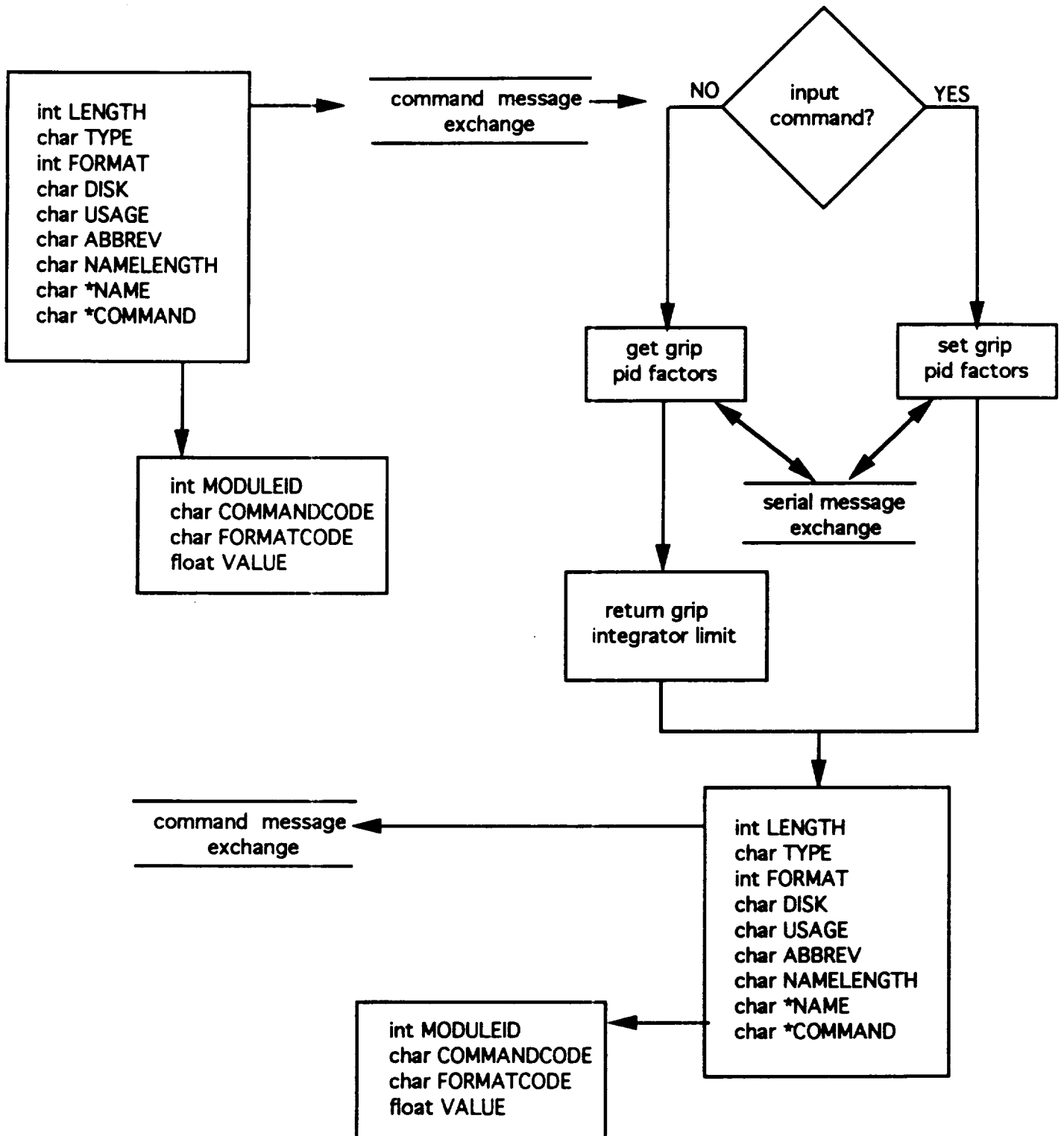
**RADIAL INTEGRATOR LIMIT COMMAND
COMMANDCODE #79**



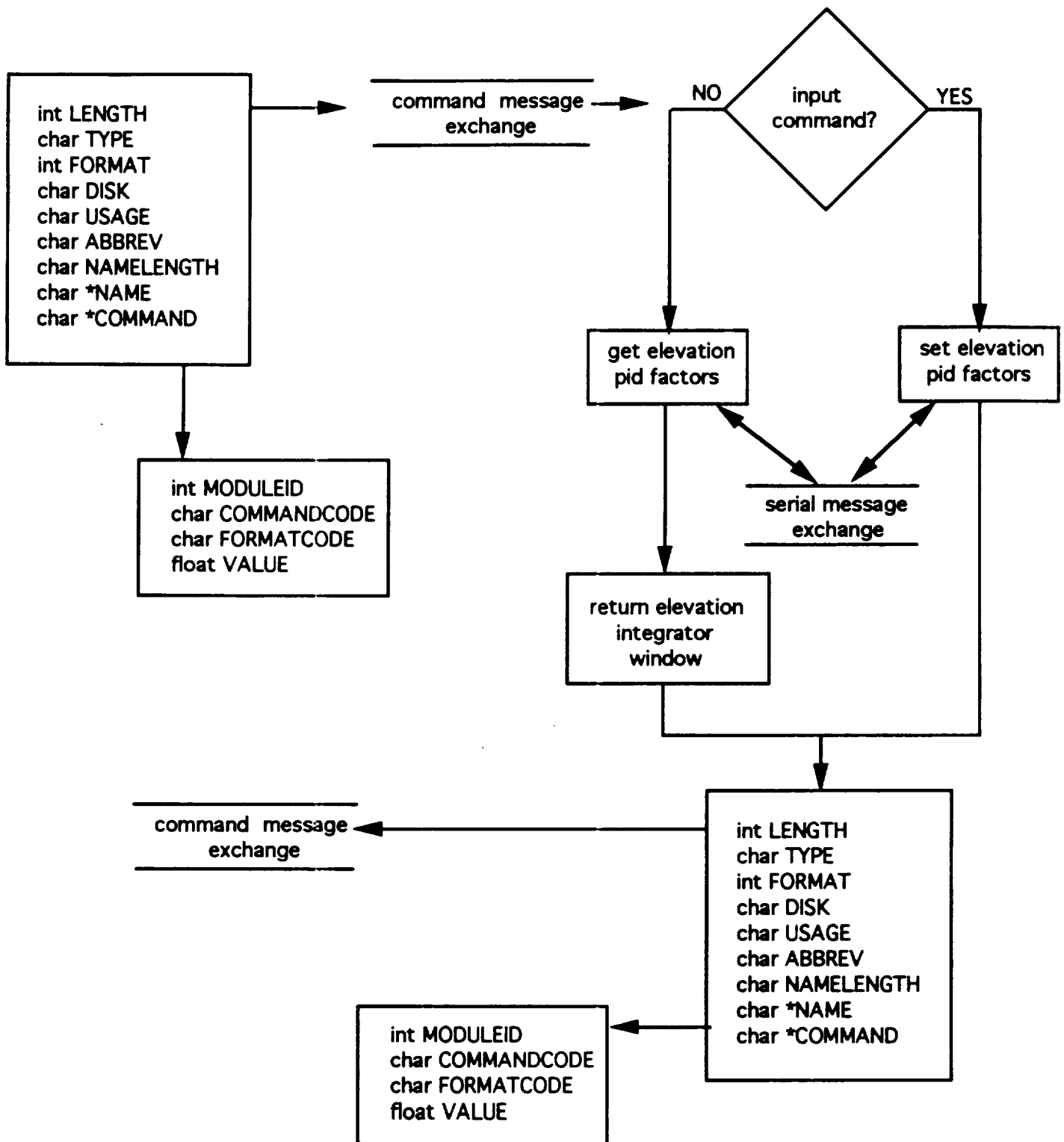
**AZIMUTH INTEGRATOR LIMIT COMMAND
COMMANDCODE #80**



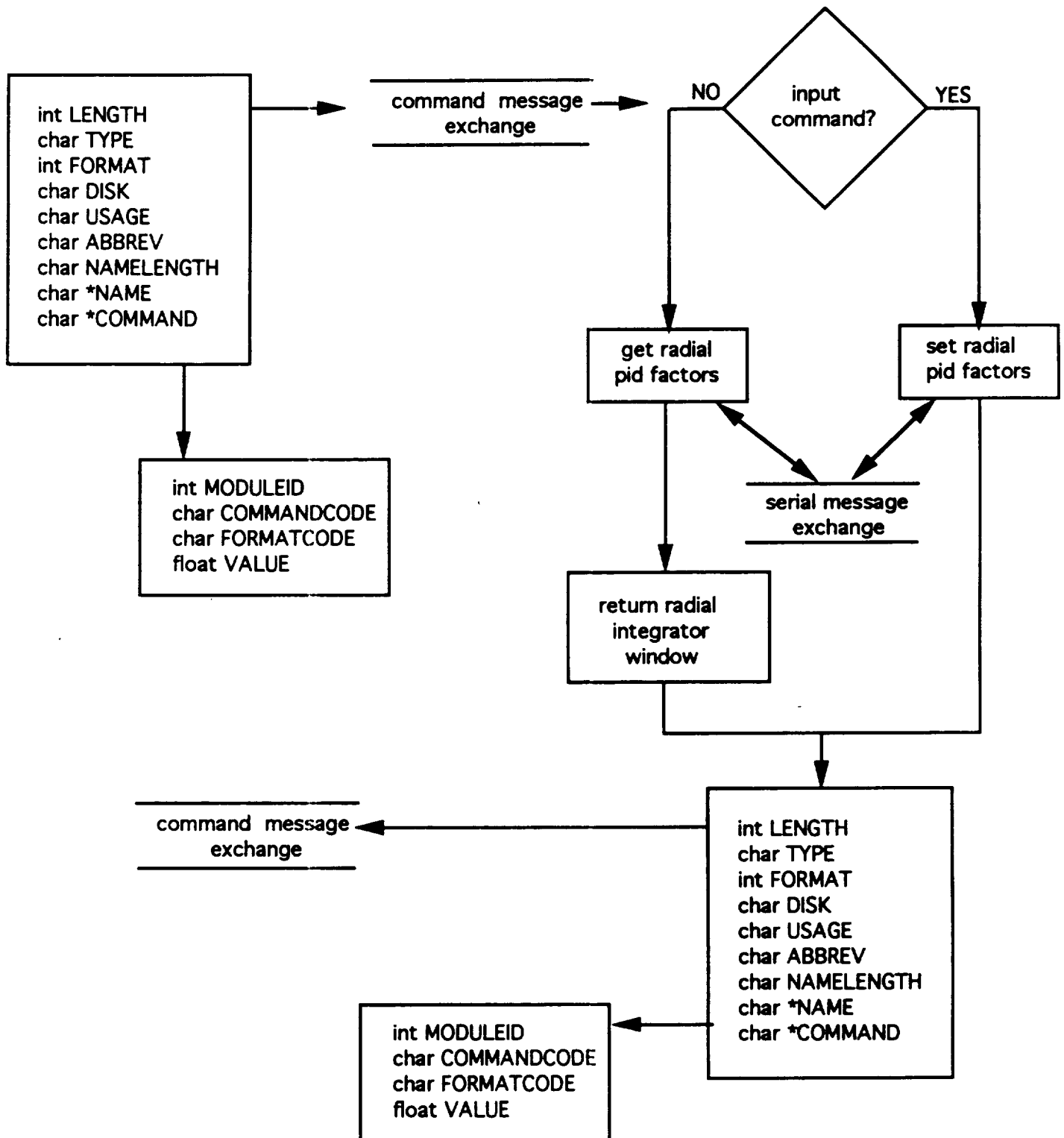
GRIP INTEGRATOR LIMIT COMMAND COMMANDCODE #81



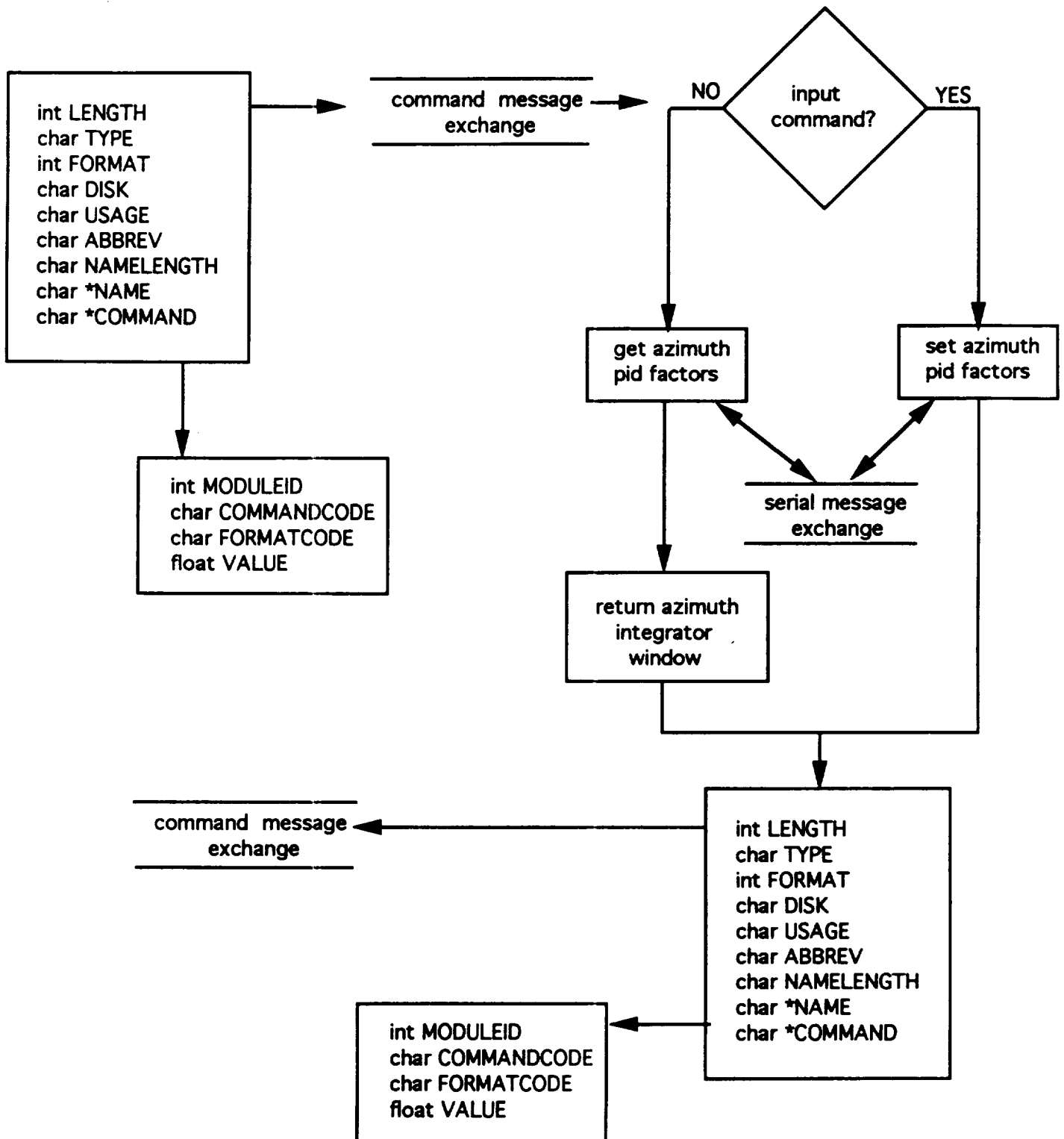
ELEVATION INTEGRATOR WINDOW COMMAND COMMANDCODE #82



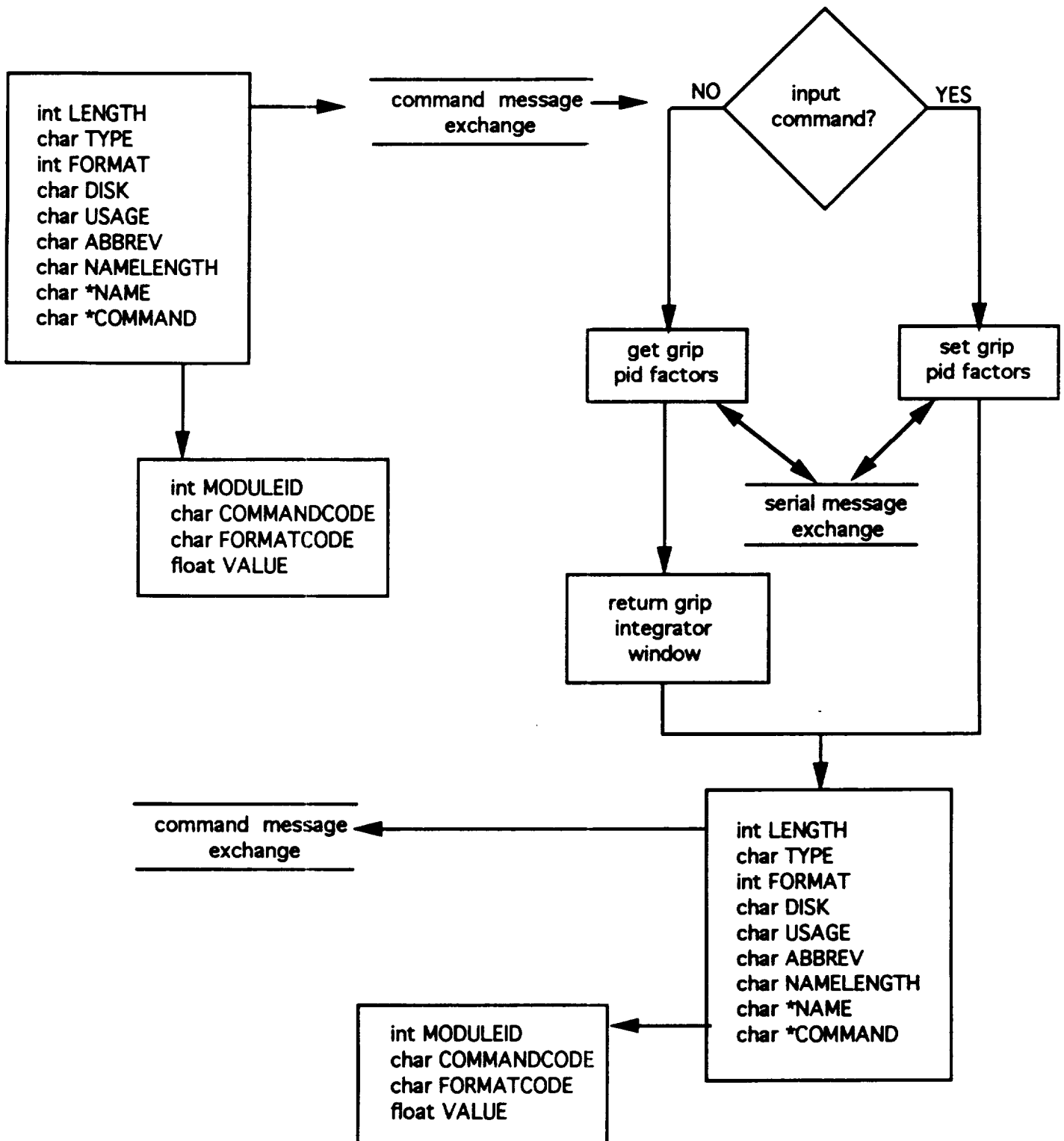
**RADIAL INTEGRATOR WINDOW COMMAND
COMMANDCODE #83**



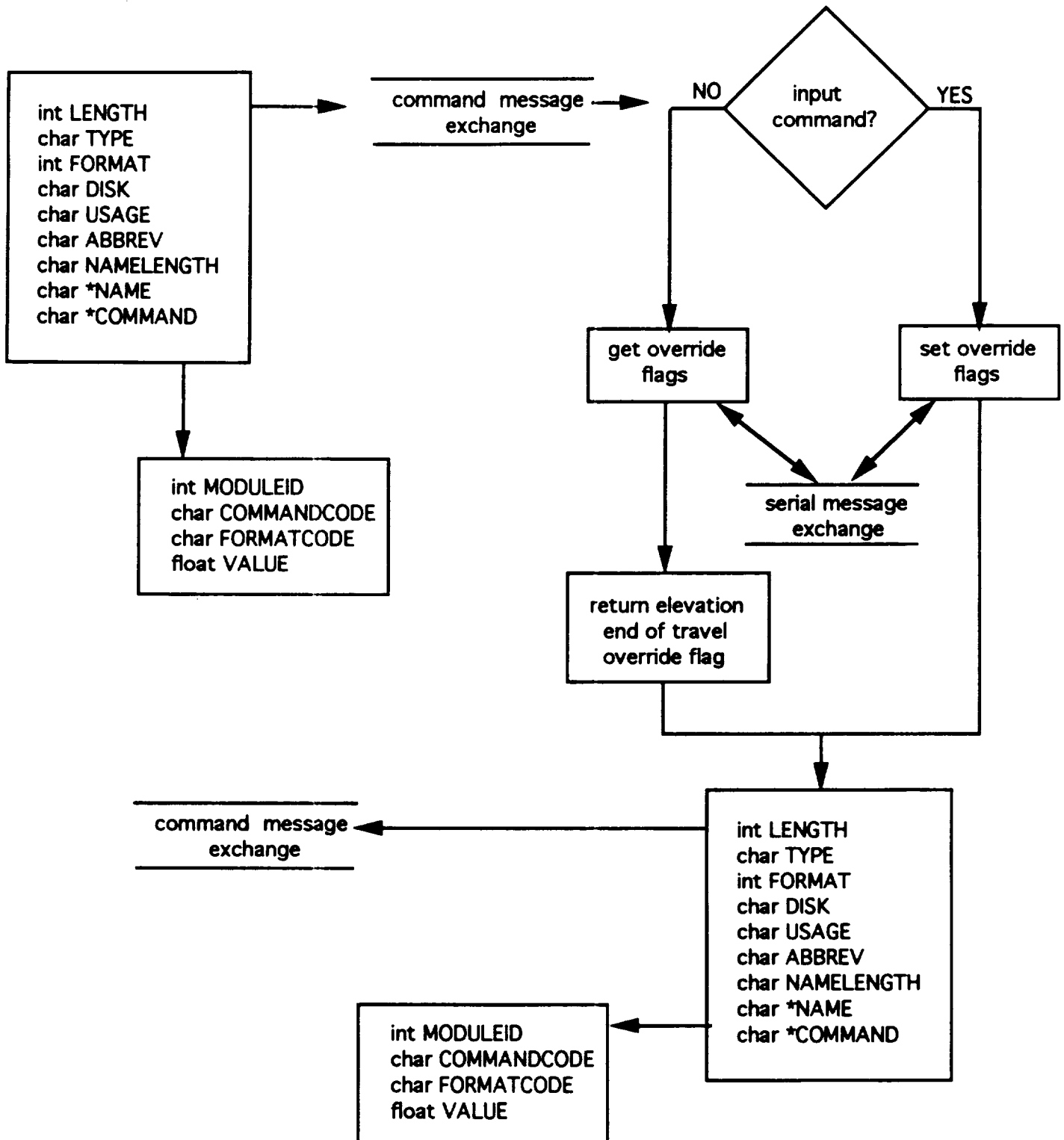
**AZIMUTH INTEGRATOR WINDOW COMMAND
COMMANDCODE #84**



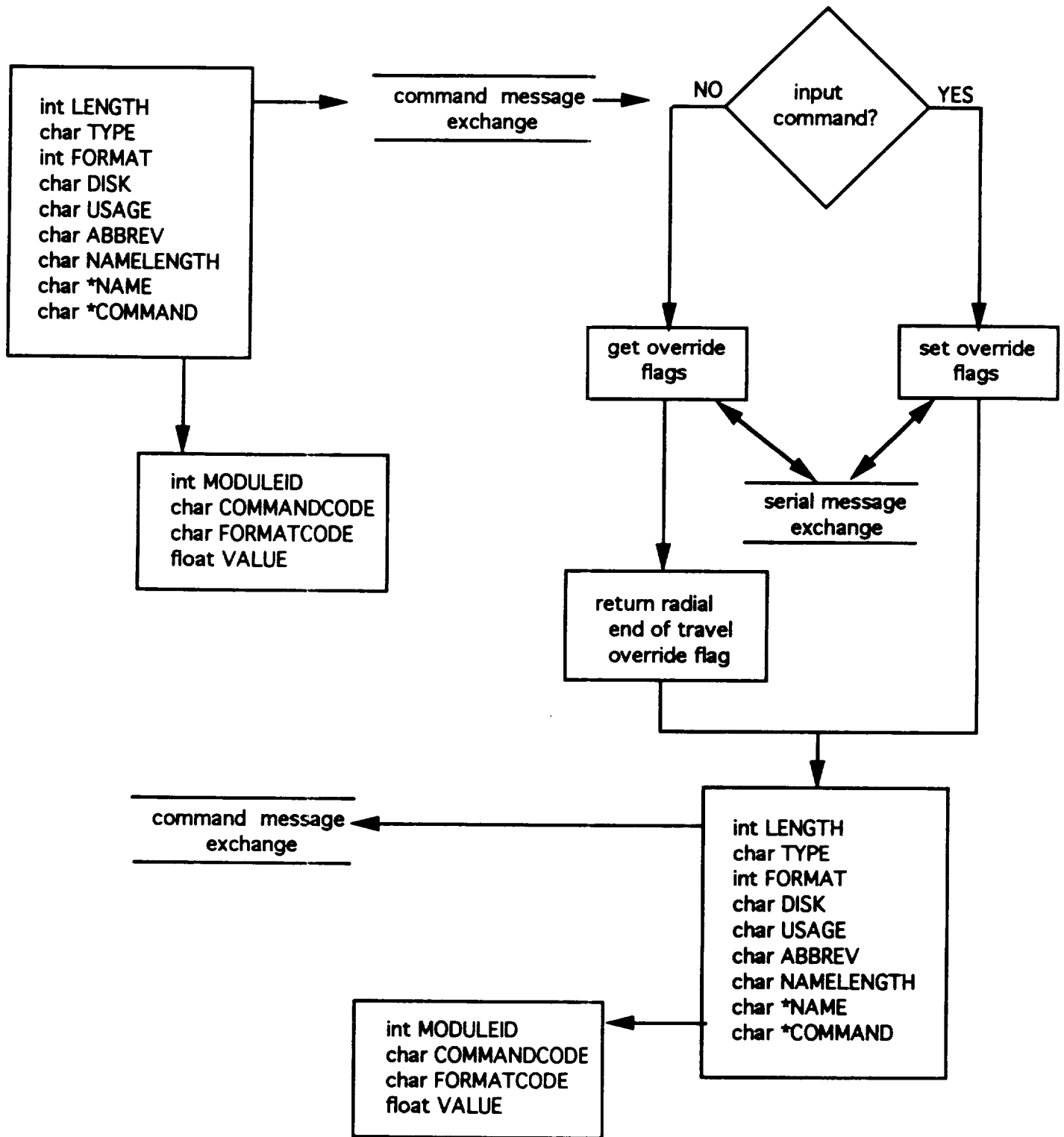
GRIP INTEGRATOR WINDOW COMMAND
COMMANDCODE #85



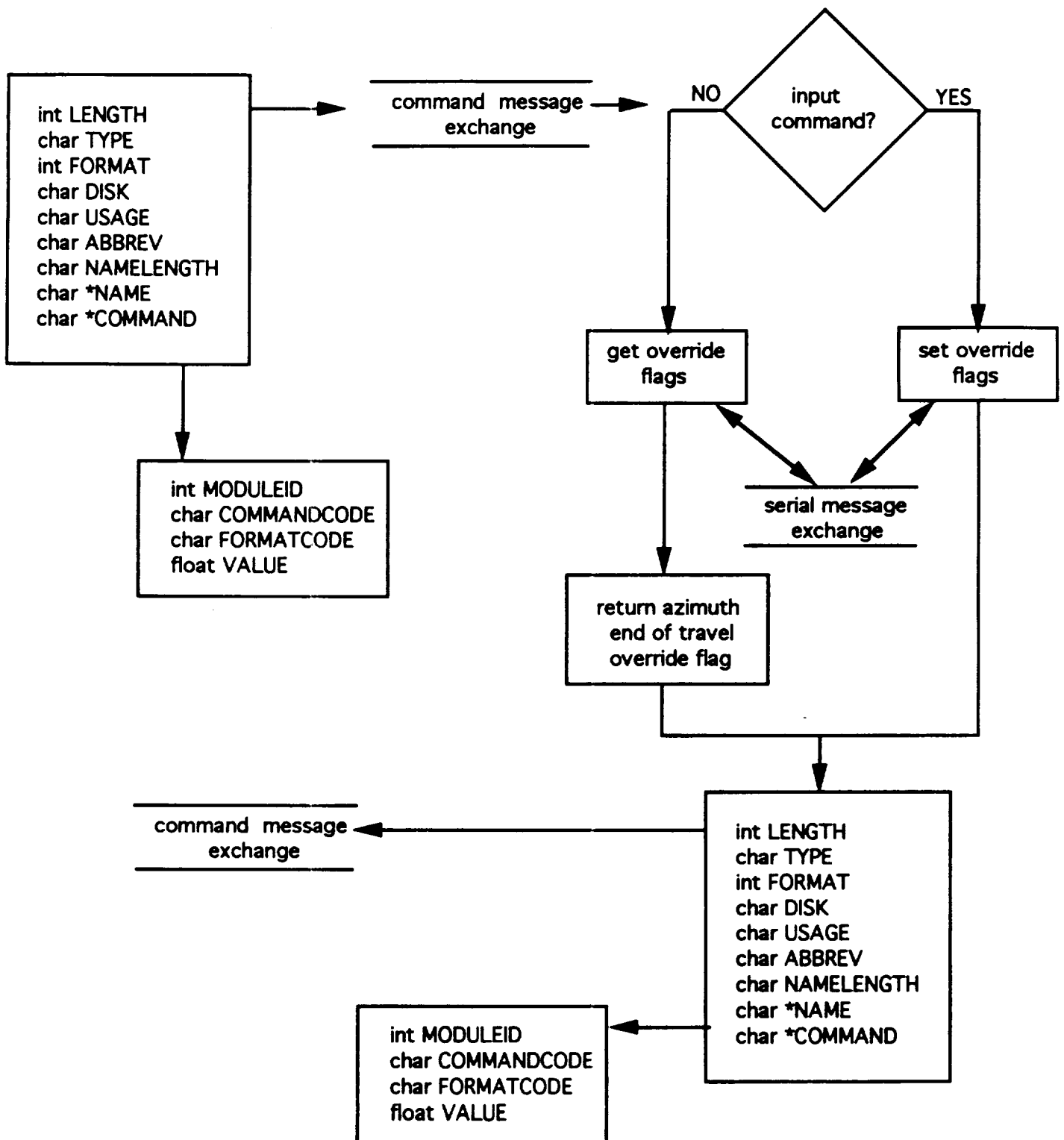
ELEVATION END OF TRAVEL OVERRIDE COMMAND
COMMANDCODE #86



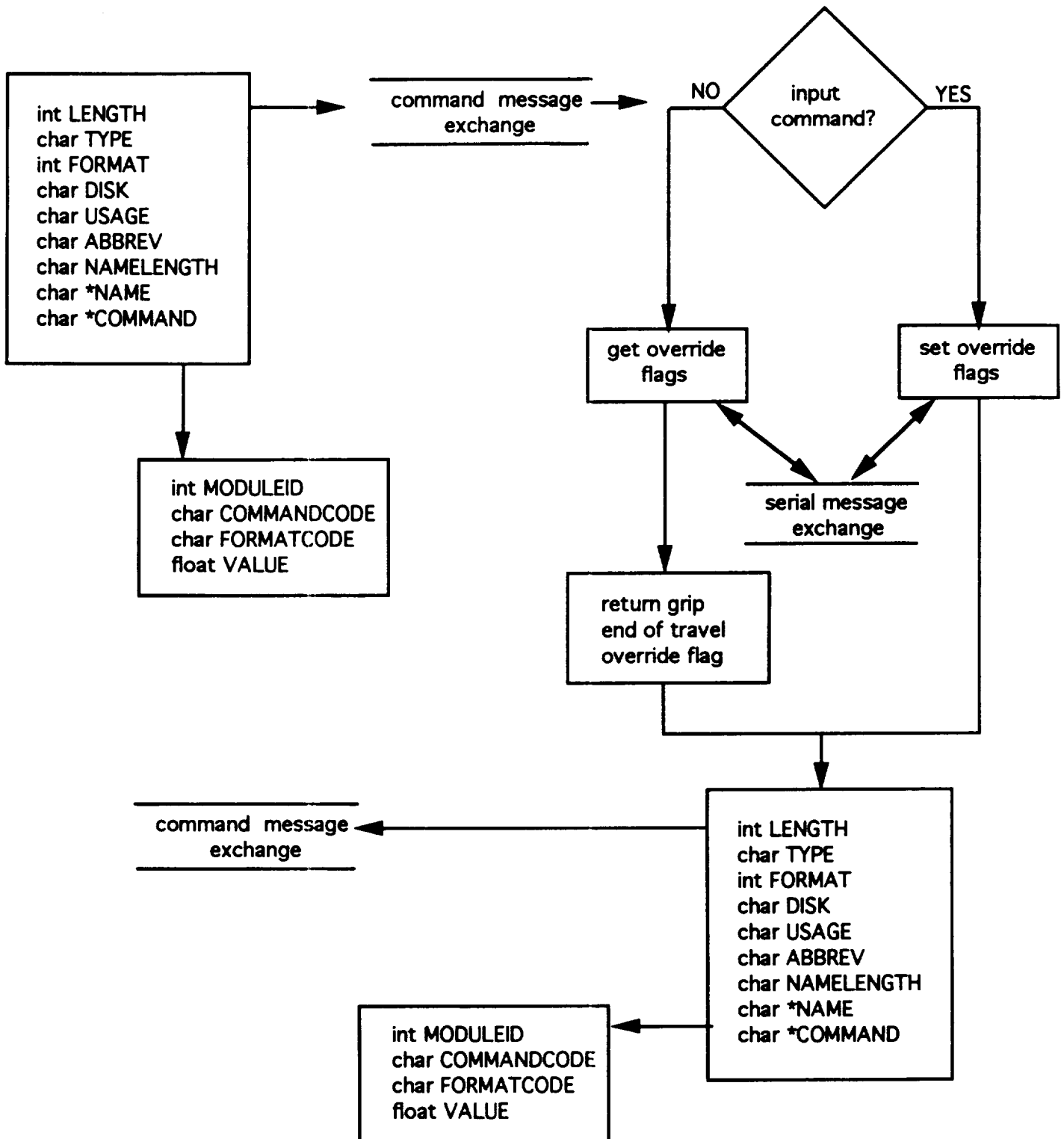
**RADIAL END OF TRAVEL OVERRIDE COMMAND
COMMANDCODE #87**



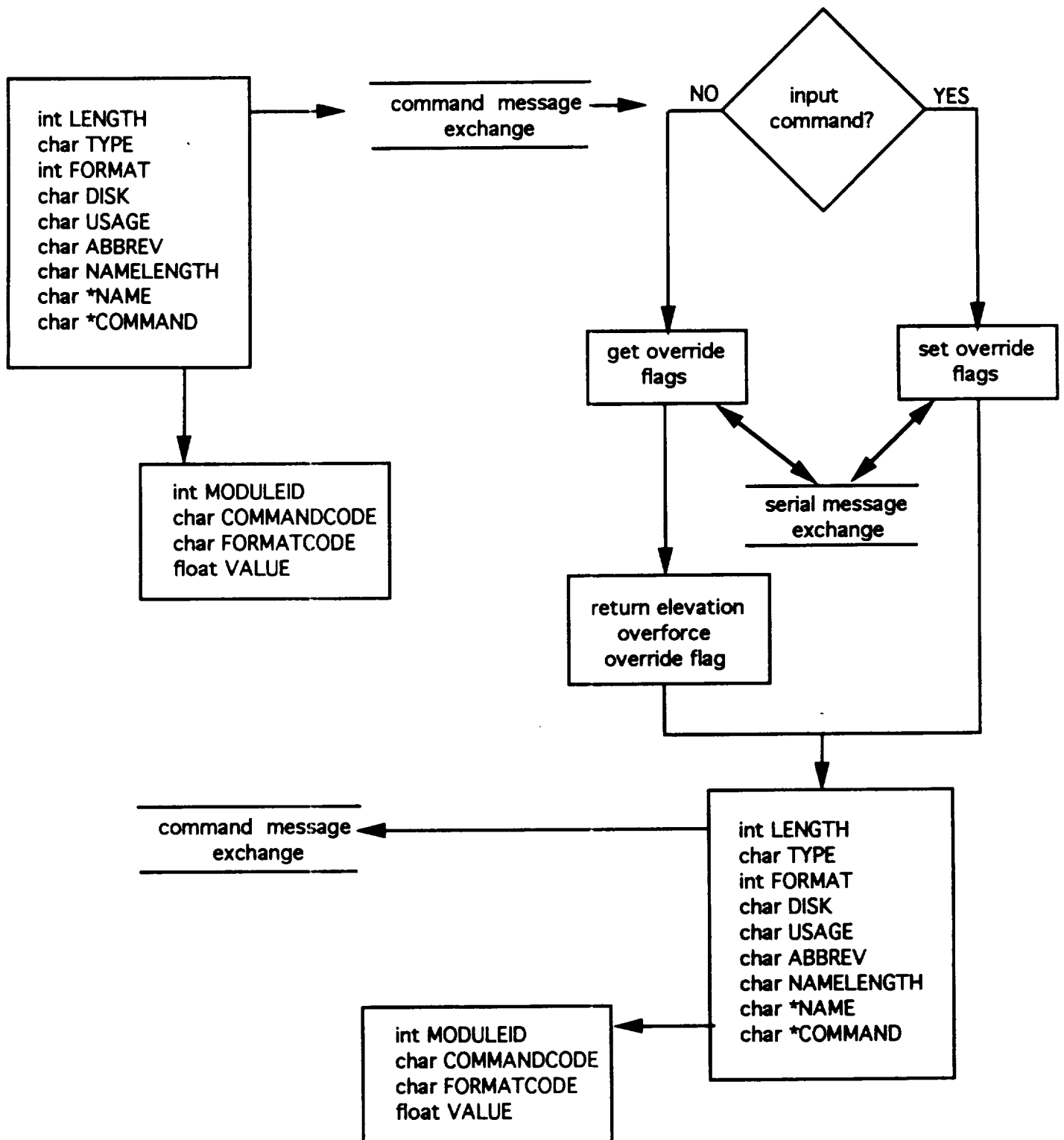
**AZIMUTH END OF TRAVEL OVERRIDE COMMAND
COMMANDCODE #88**



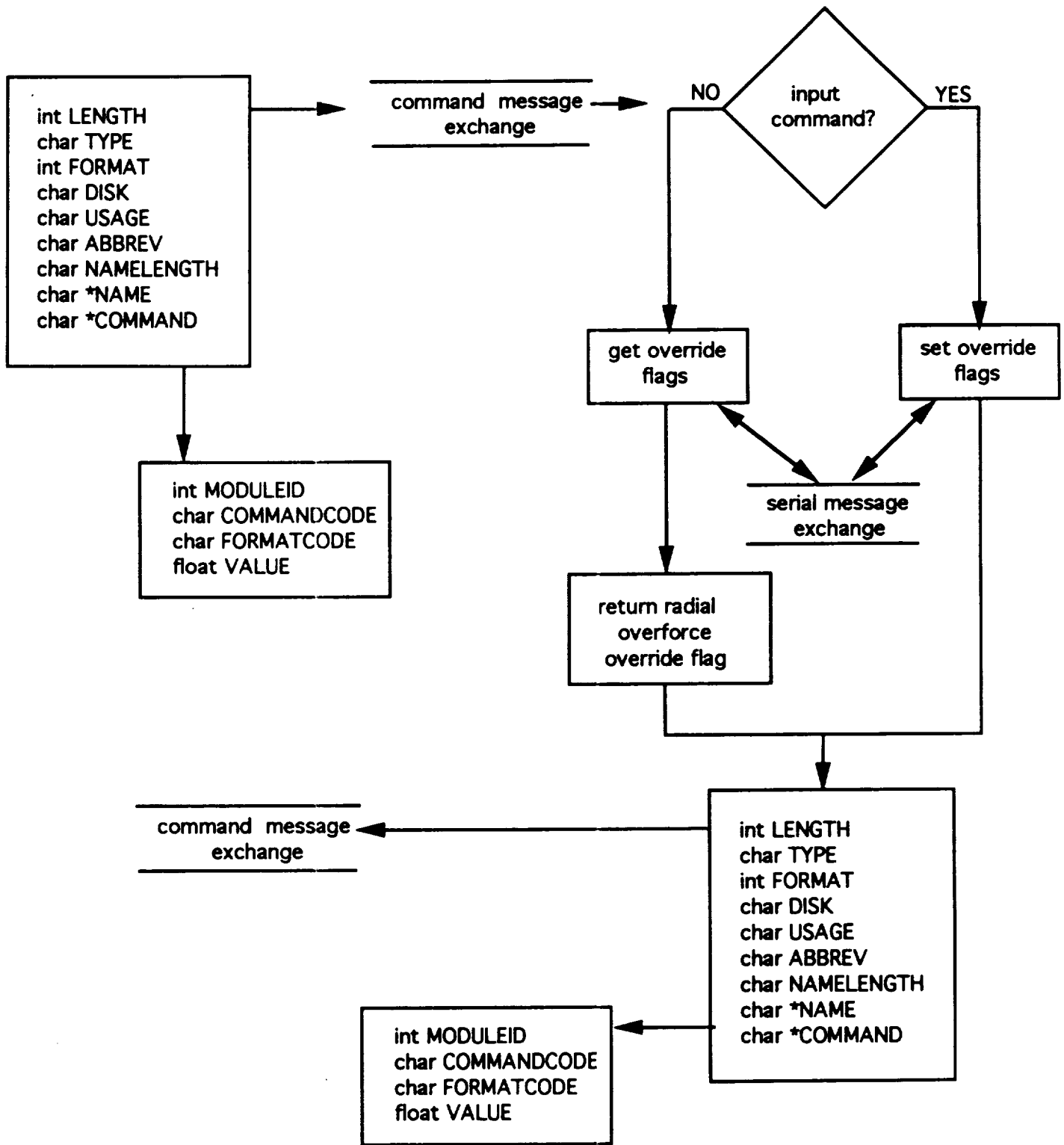
GRIP END OF TRAVEL OVERRIDE COMMAND
COMMANDCODE #89



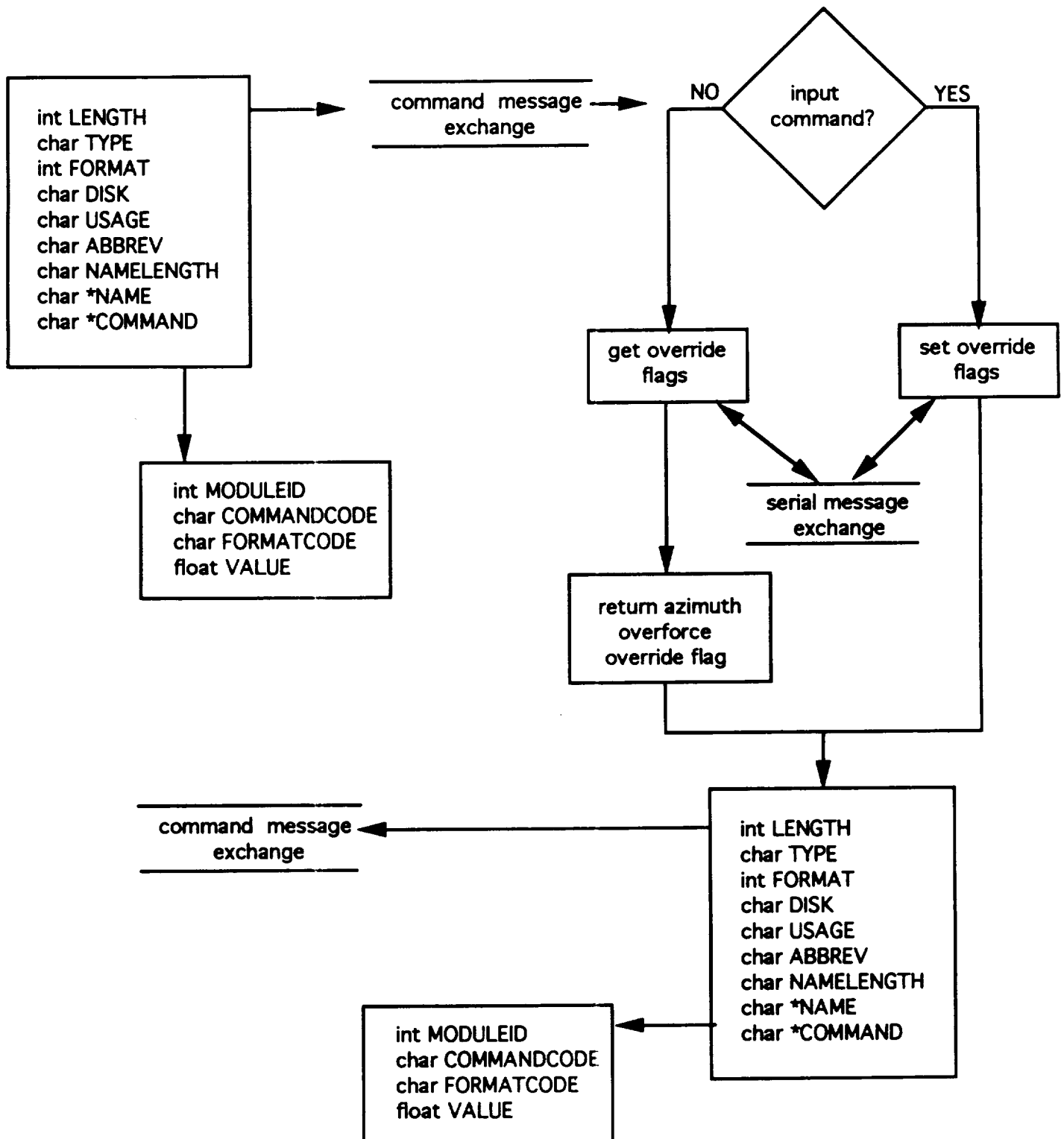
ELEVATION OVERFORCE OVERRIDE COMMAND COMMANDCODE #90



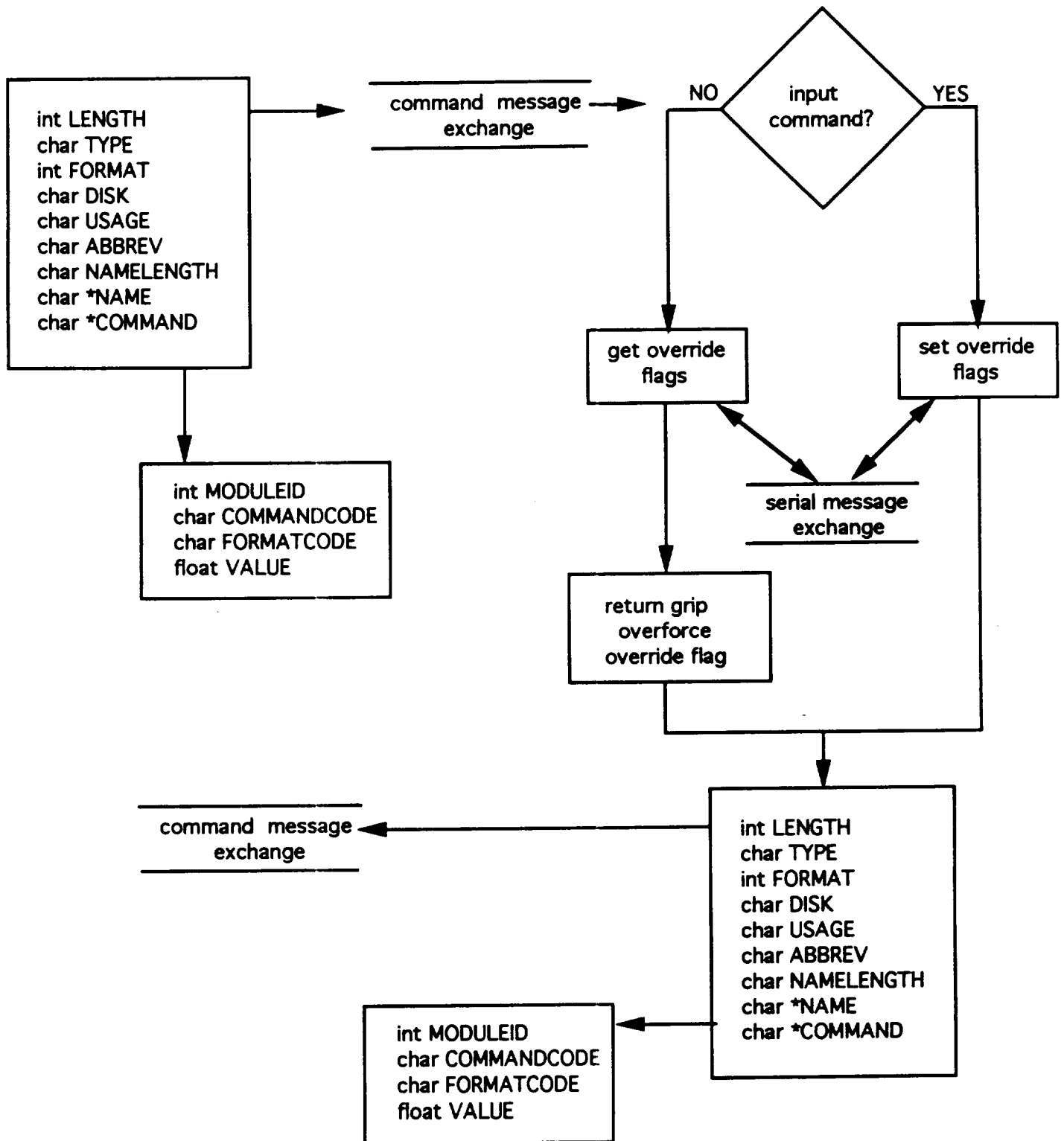
**RADIAL OVERFORCE OVERRIDE COMMAND
COMMANDCODE #91**



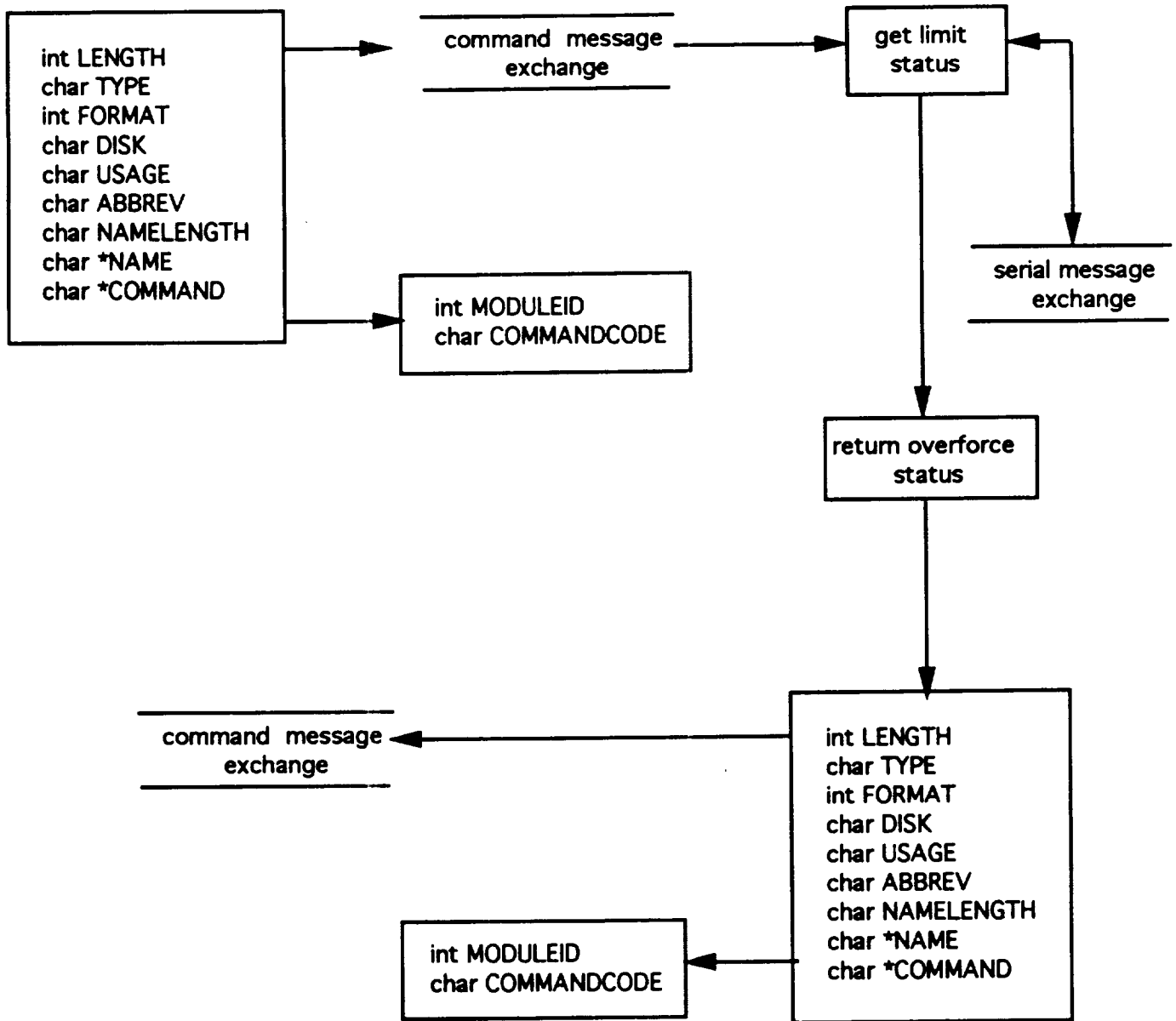
**AZIMUTH OVERFORCE OVERRIDE COMMAND
COMMANDCODE #92**



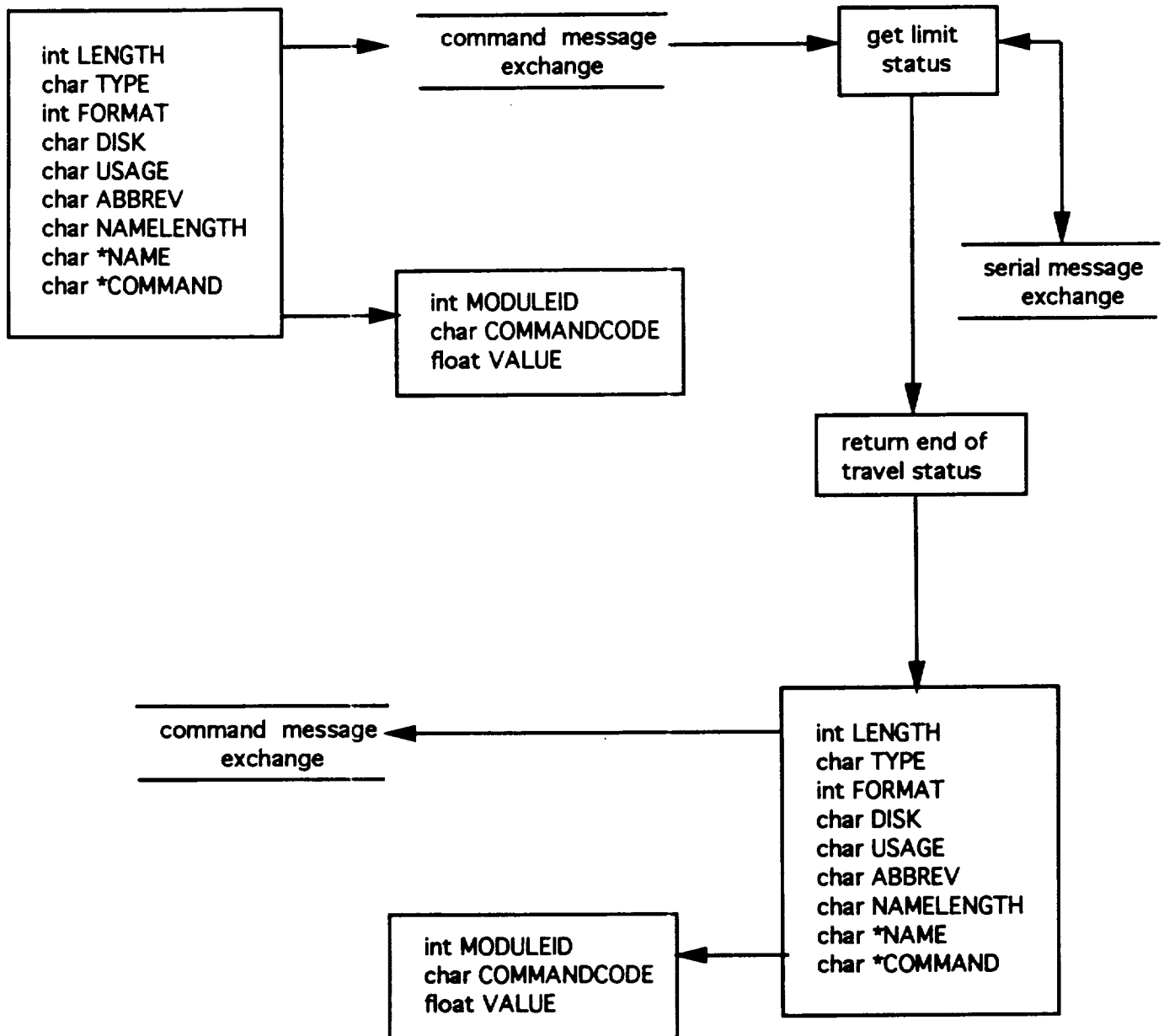
GRIP OVERFORCE OVERRIDE COMMAND
COMMANDCODE #93



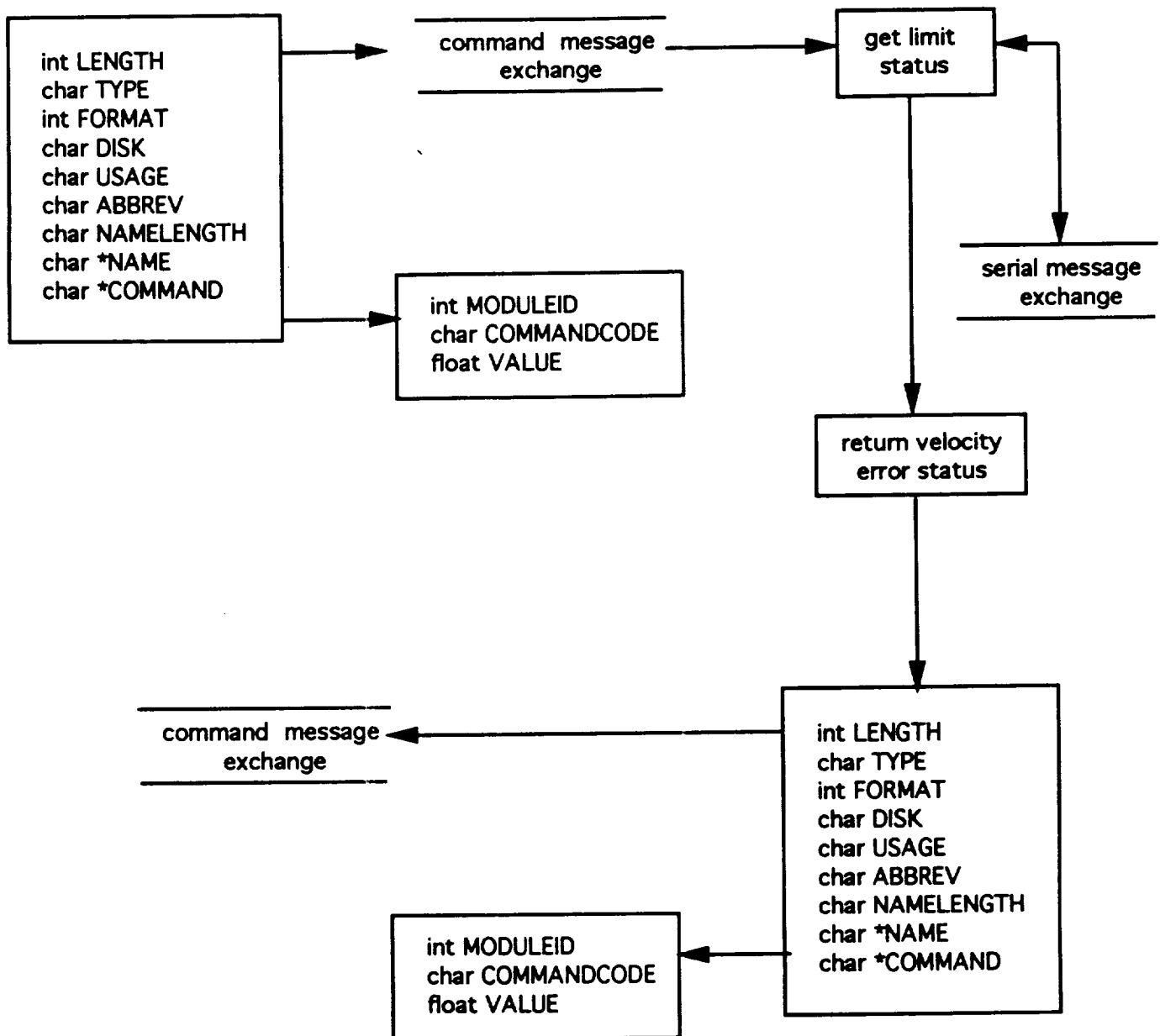
OVERFORCE STATUS COMMAND
COMMANDCODE #94



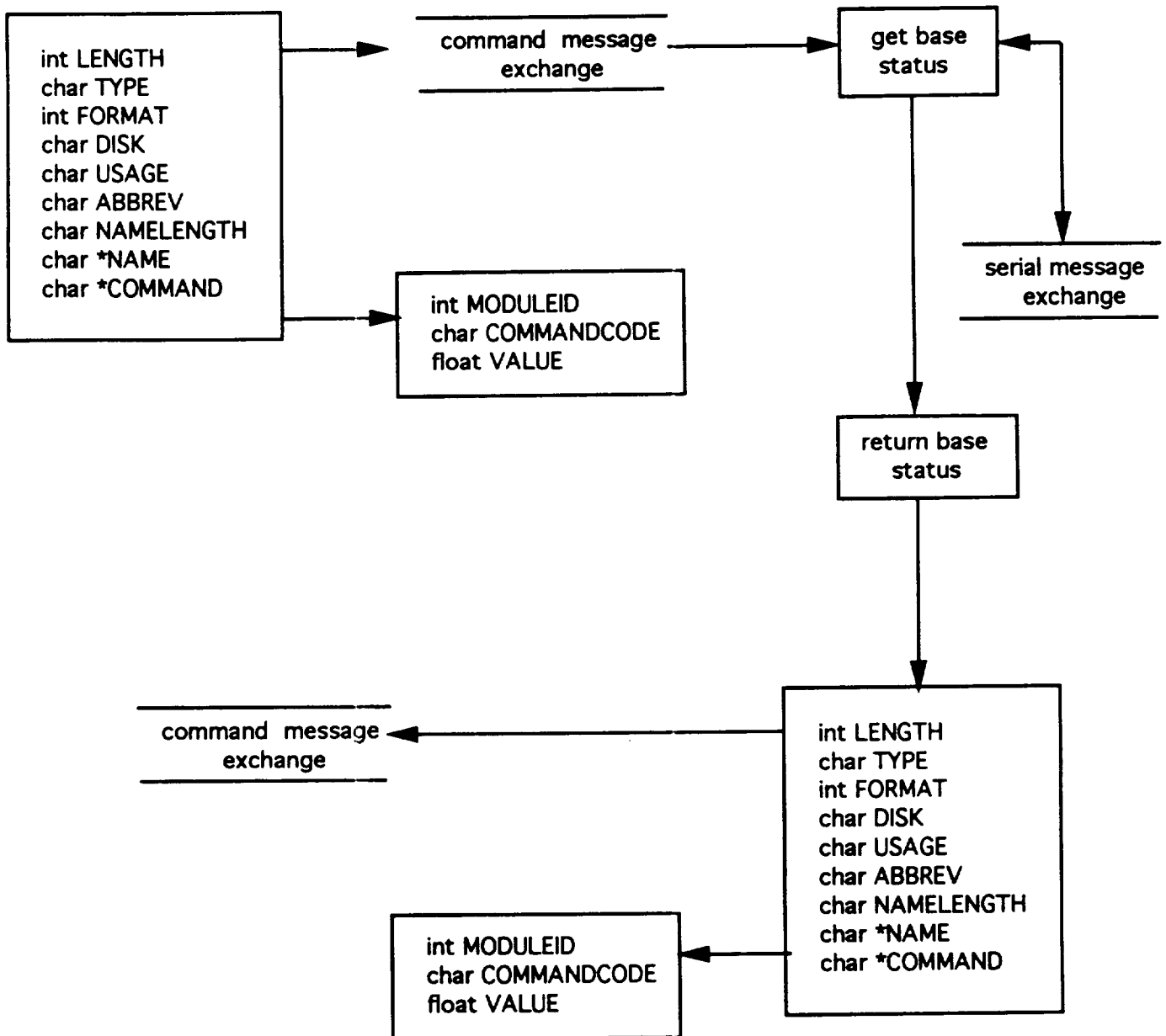
END OF TRAVEL STATUS COMMAND
COMMANDCODE #95



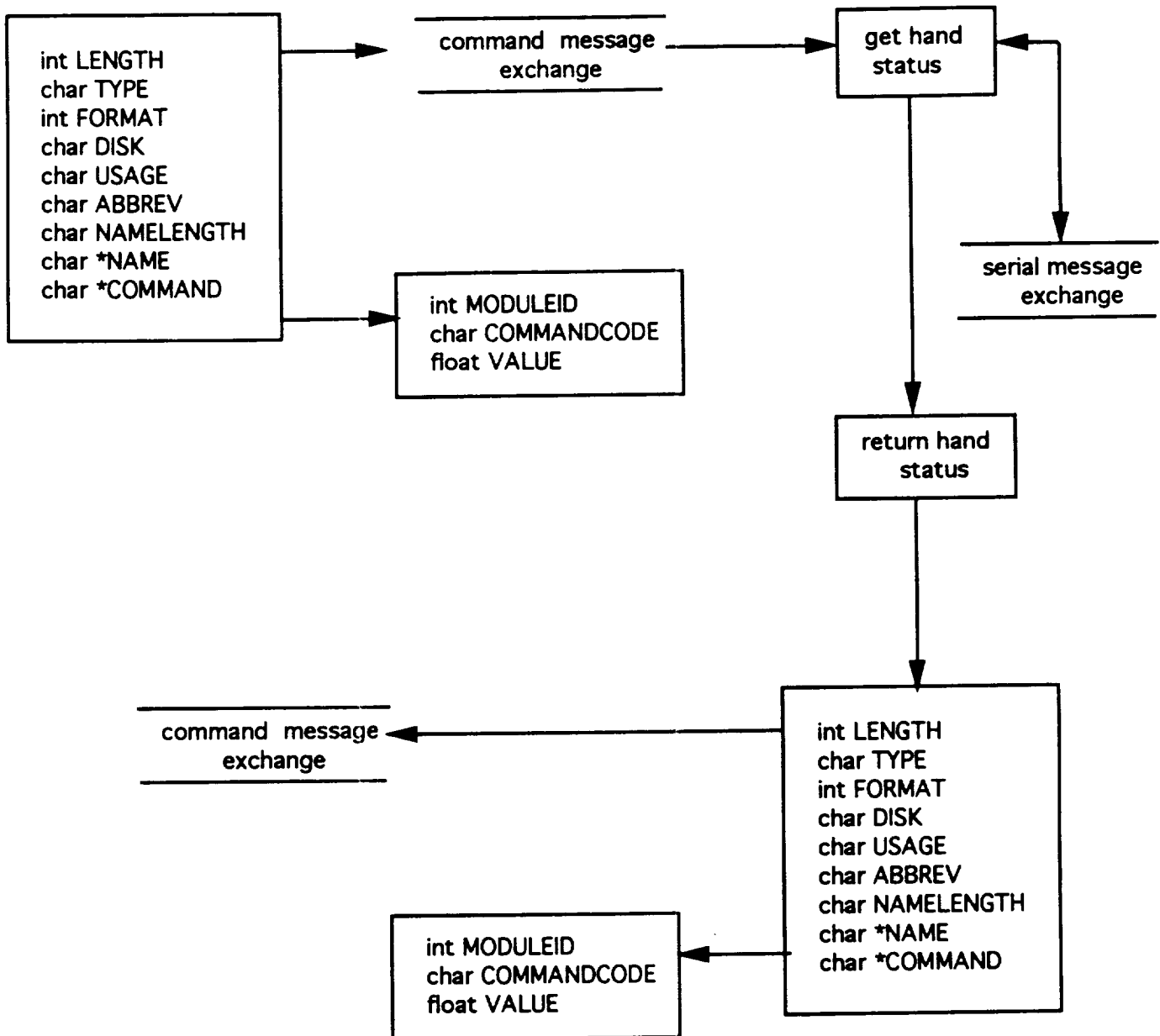
VELOCITY ERROR STATUS COMMAND
COMMANDCODE #96



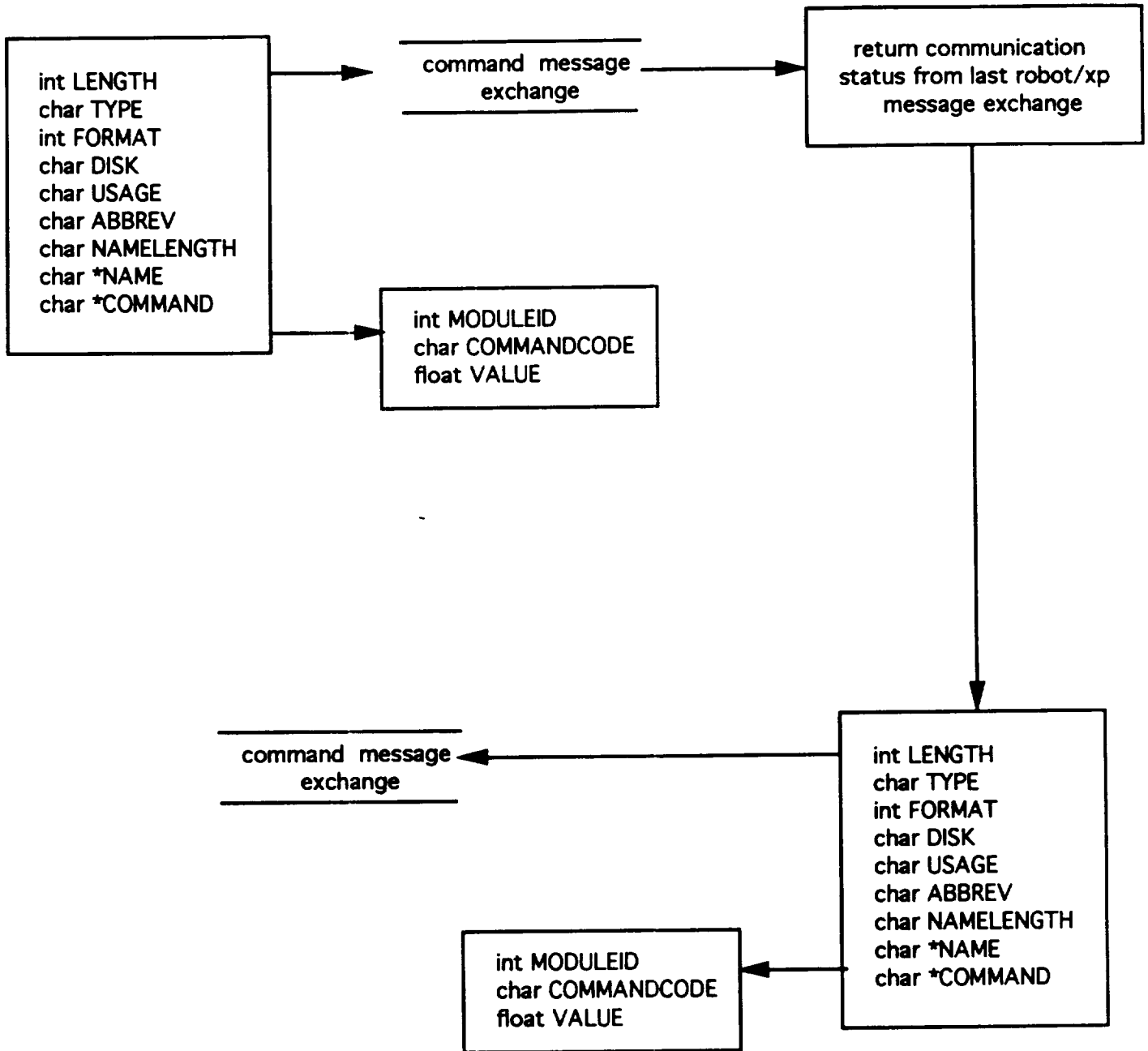
BASE MOVE STATUS COMMAND
COMMANDCODE #97



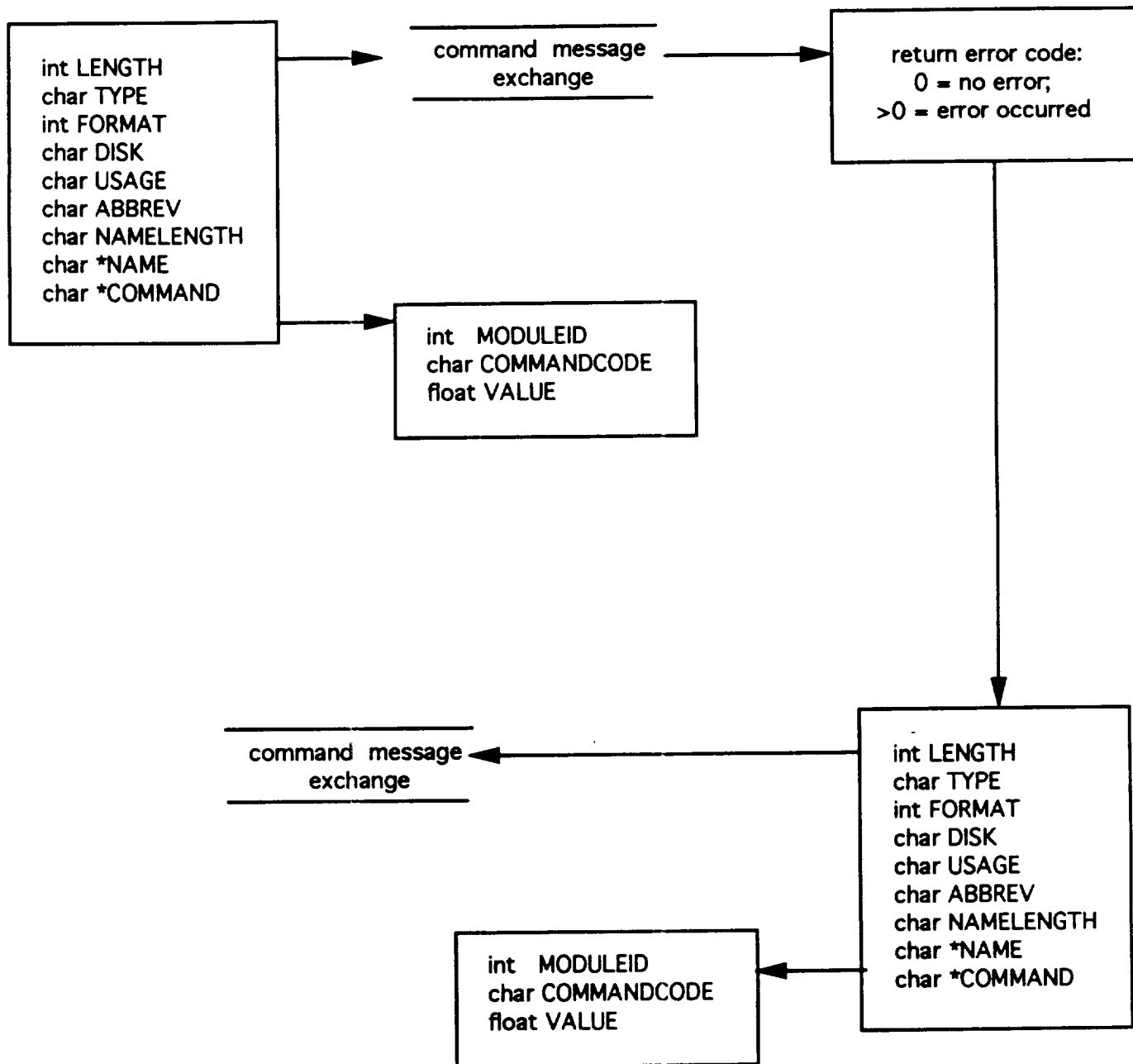
GRIP MOVE STATUS COMMAND COMMANDCODE #98



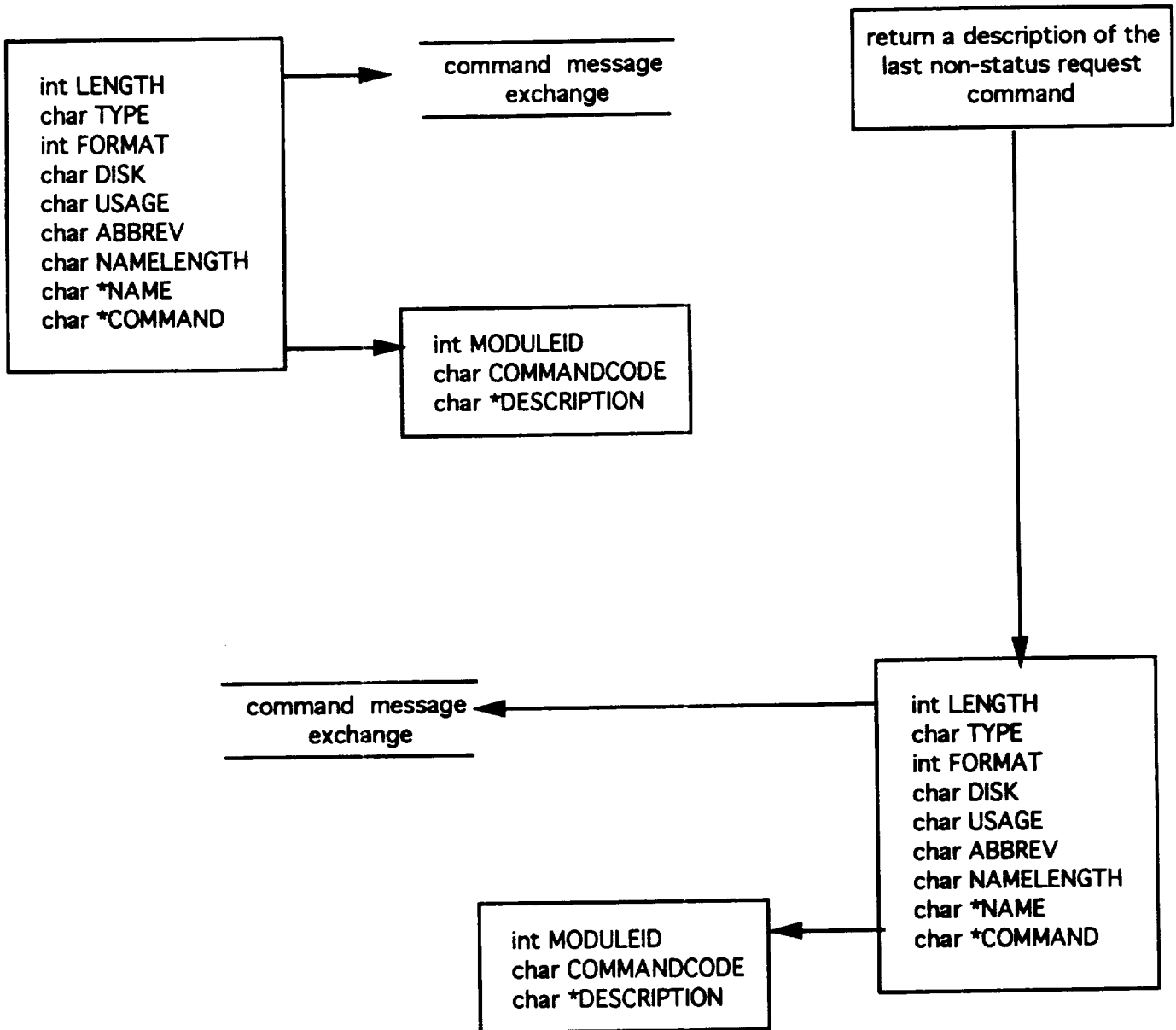
COMMUNICATION STATUS COMMAND
COMMANDCODE #99



MODULE STATUS COMMAND
COMMANDCODE #100



ERROR DESCRIPTION COMMAND COMMANDCODE #101



EASYLAB PROGRAMS DEFINITIONS

ROBOT MODULE EASYLAB PROGRAMS

Space Automated Research Center (SpARC)

December 3, 1992

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GET.FROM.RACK	2
PUT.INTO.RACK.....	2
LAUNCHLOCK.....	3

NAME: **GET.FROM.RACK**

SYNTAX: GETFROMRACK

DESCRIPTION: Get a sample from a rack. The rack number and sample number must be defined before this command is executed.

RETURNS: OK - successful return
 NOTOK - error return

In addition to a NOTOK error return, a message is printed on the terminal and S:MODULE.STATUS is set to indicate the error.

EXAMPLE: RACK.NUMBER = 1
 SAMPLE.NUMBER = 5
 GETFROMRACK

NAME: **PUT.INTO.RACK**

SYNTAX: PUT.INTO.RACK

DESCRIPTION: Put a sample into a rack. The rack number and sample number must be defined before this command is executed.

RETURNS: OK - successful return
 NOTOK - error return

In addition to a NOTOK error return, a message is printed on the terminal and S:MODULE.STATUS is set to indicate the error.

EXAMPLE: RACK.NUMBER = 1
 SAMPLE.NUMBER = 5
 GETFROMRACK

NAME: **LAUNCHLOCK**

SYNTAX: **LAUNCHLOCK**

DESCRIPTION: Move the robot arm to the launch lock position. This command puts the robot arm in a safe position for takeoff and landing.

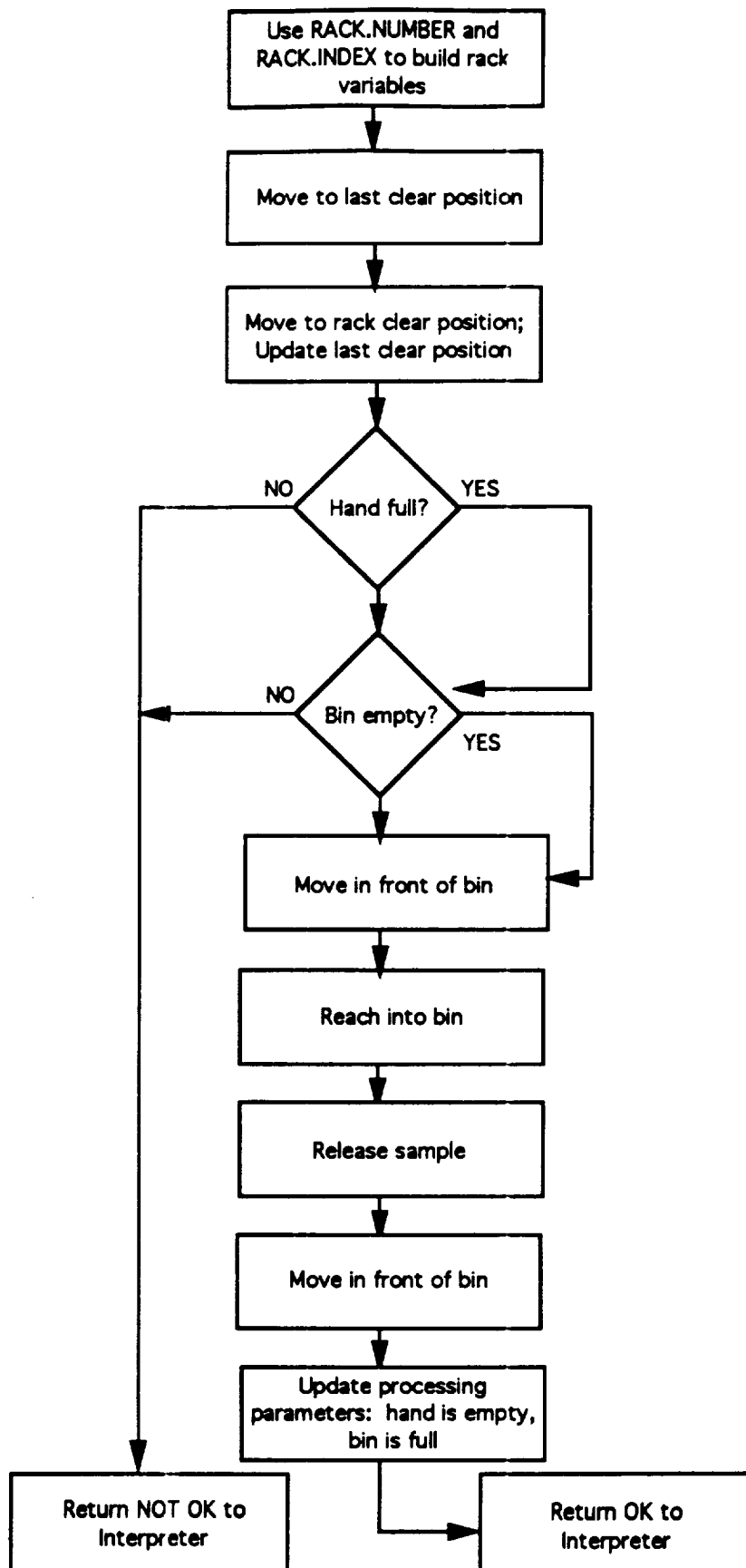
RETURNS: **OK** - successful return
 NOTOK - error return

In addition to a NOTOK error return, a message is printed on the terminal and S:MODULE.STATUS is set to indicate the error.

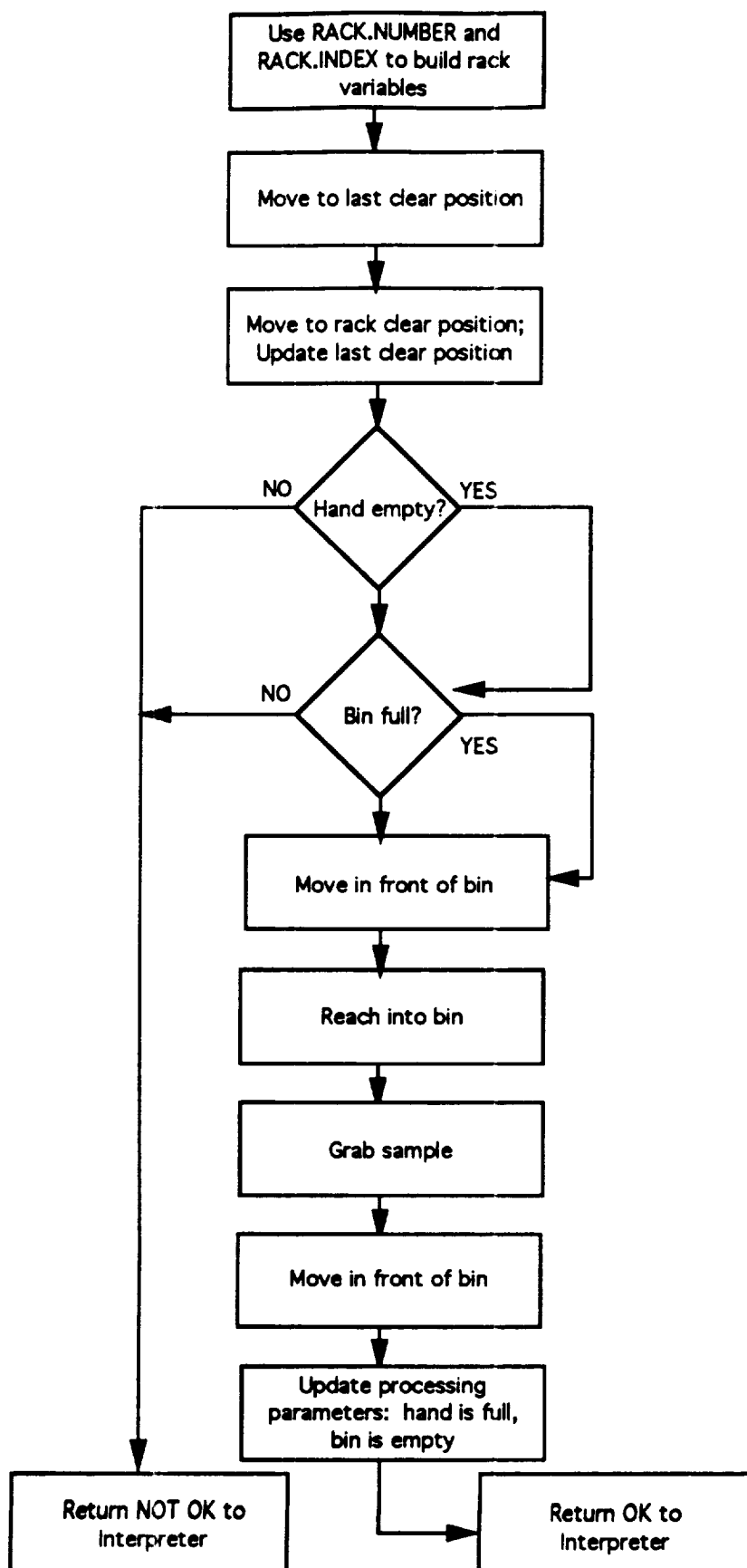
EXAMPLE: **LAUNCHLOCK**

**ROBOT
EASYLAB PROGRAMS
FLOW CHARTS**

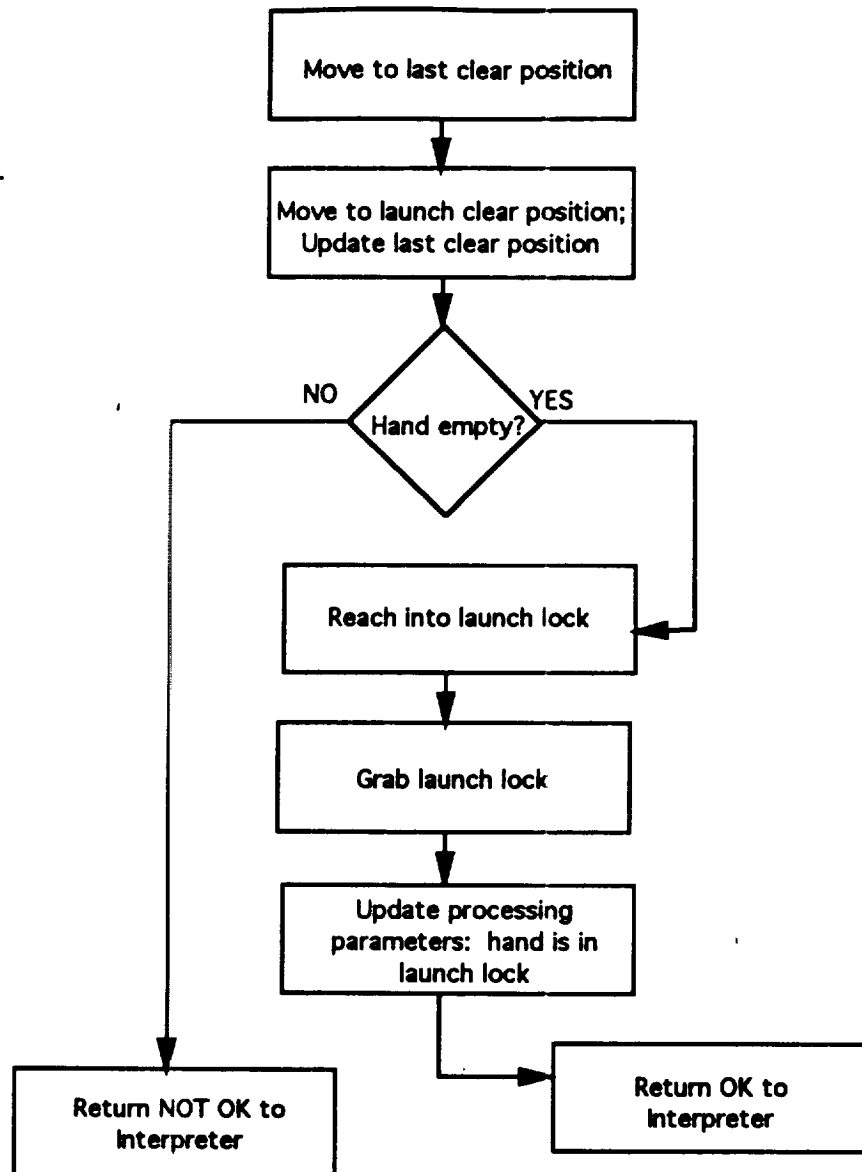
EASYPAC PROGRAM: PUT.INTO.RACK PROCESSING FLOW CHART



EASYPAC PROGRAM: GET.FROM.RACK
PROCESSING FLOW CHART



EASYPAC PROGRAM: LAUNCH.LOCK PROCESSING FLOW CHART



ROBOT MODULE FAULT CONDITIONS

ROBOT ERROR CONDITIONS

The Robot Module is capable of detecting the following types of errors:

Robot/XP Communication errors:

- Interbyte timeout
- Invalid byte count
- Invalid command code
- Invalid checksum

XP Processing Errors

- Elevation axis failed to reach position
- Elevation axis is in end of travel limit
- Elevation axis overforce
- Elevation axis stalled
- Radial axis failed to reach position
- Radial axis is in end of travel limit
- Radial axis overforce
- Radial axis stalled
- Azimuth axis failed to reach position
- Azimuth axis is in end of travel limit
- Azimuth axis stalled
- Gripper axis failed to reach position
- Gripper axis is in end of travel limit
- Gripper axis overforce
- Gripper axis stalled

Robot Processing Errors

- WARNING.. ILLEGAL SET ABSOLUTE COMMAND

Either the command variable does not exist or an absolute move was issued for a command variable of the wrong type

- INDEX VALUE OUT OF RANGE FOR THIS RACK

$1 < \text{rack index} < \text{row} * \text{col}$

- STOP KEY PRESSED

User pressed STOP key

- ROBOT INIT ERROR AXIS: <axis>

Initialization error on the specified axis

- ENTRY NOT FOUND

Command variable not found in data dictionary

- CALIBRATION DATA IS OUT OF 10% ALLOWABLE RANGE

The calibration data entered must be within 10% of the minimum and maximum axis range

- MONUMENT DEFINITION CANNOT BE STORED IN DICTIONARY

Error trying to store the monument definition

- NAME CANNOT BE USED AS A MONUMENT POSITION

A symbol exists with the same name but different type or is owned by someone else

- MONUMENT MUST BE DEFINED BEFORE A HAND

Monument position must be defined before the user can define a hand

- NAME ALREADY USED - CANNOT BE STORED IN DICTIONARY

Cannot use an existing hand name when defining a new hand

- COMMAND IS NOT AN OUTPUT COMMAND

Attempt to do an output operation on a command which is not an output command

- COMMAND IS NOT FOR THIS ROBOT

Attempt to execute a command which is not owned by the robot module

- **NOT IN POSITION**

An axis did not move to the desired location, either because the STOP key was pressed or because the XP could not position the axis correctly

- **ROBOT CANNOT SIGN ON**

Robot module cannot sign into the Zymate system

- **ROBOT VERSION IS NOT AVAILABLE**

Robot version is not stored in the data dictionary

- **HAND MUST BE ENTERED BEFORE A RACK CAN BE ACCESSED**

Attempt to move to a rack before picking up a hand

ROBOT STATUS COMMAND VARIABLES

The following list defines the Robot Status Command Variables and their values:

S:OVF.STATUS

Bit 0	Gripper Left is in OVF Open
Bit 1	Gripper Left is in OVF Closed
Bit 2	Gripper Right is in OVF Open
Bit 3	Gripper Right is in OVF Closed
Bit 4	Radial axis is in OVF In
Bit 5	Radial axis is in OVF Out
Bit 6	Elevation axis is in OVF Up
Bit 7	Elevation axis is in OVF Down

S:EOT.STATUS

Bit 0	Gripper is in EOT Open
Bit 1	Gripper is in EOT Closed
Bit 2	Azimuth axis is in EOT Left
Bit 3	Azimuth axis is in EOT Right
Bit 4	Radial axis is in EOT In
Bit 5	Radial axis is in EOT Out
Bit 6	Elevation axis is in EOT Up
Bit 7	Elevation axis is in EOT Down

S:VA.STATUS

Bit 0	Gripper Stalled
Bit 1	Azimuth Stalled
Bit 2	Radial Stalled
Bit 3	Elevation Stalled
Bit 4	Not used
Bit 5	Not used
Bit 6	Not used
Bit 7	Not used

S:BASE.STATUS

Bit 0	Azimuth axis failed to reach position
Bit 1	Elevation axis failed to reach position
Bit 2	Radial axis failed to reach position

Bit 3	Bad calibration data in ROM
Bit 4	Not used
Bit 5	Not used
Bit 6	Not used
Bit 7	Not used

S:GRIP.STATUS

Bit 0	Not used
Bit 1	Not used
Bit 2	Grip failed to reach position
Bit 3	Not used
Bit 4	Not used
Bit 5	Grip to force task active
Bit 6	Not used
Bit 7	Not used

S:COMM.STATUS

0x10	Invalid checksum
0x20	Invalid command code
0x40	Invalid byte count
0x80	Interbyte timeout

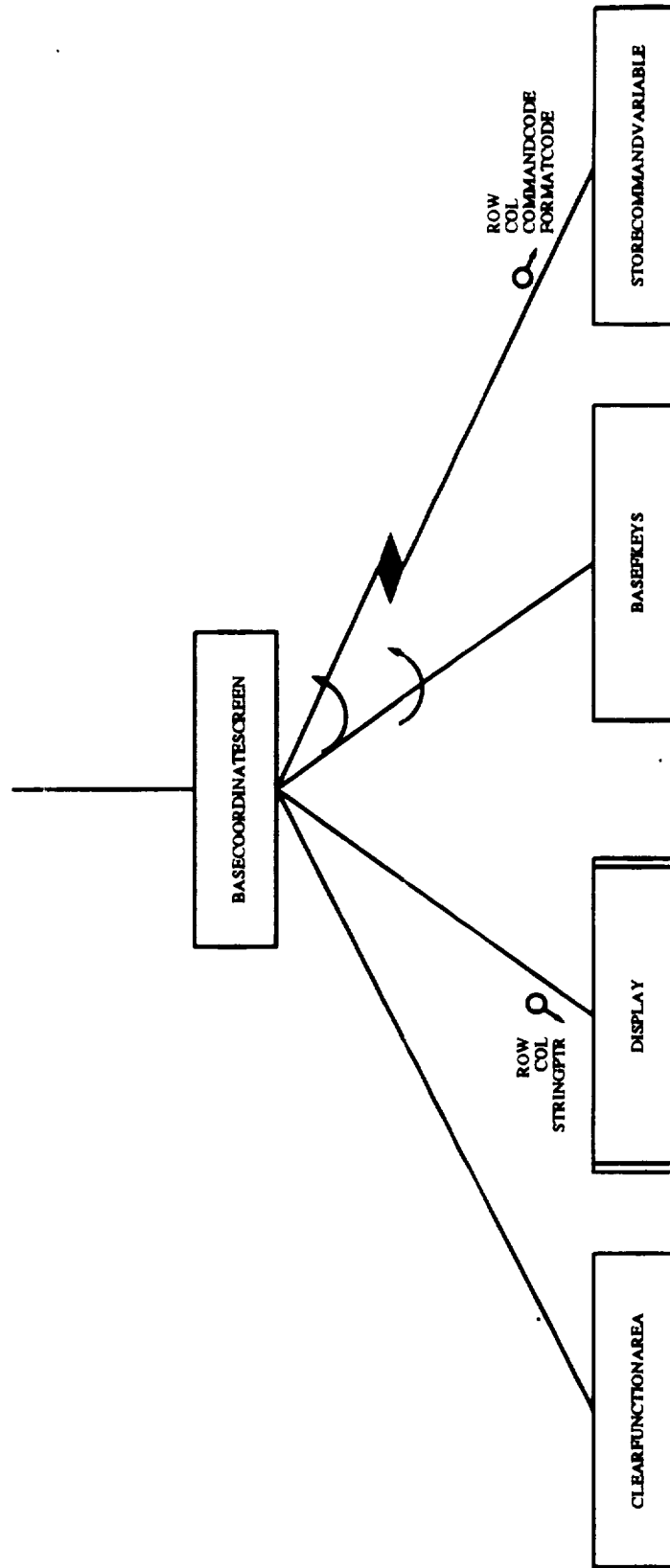
S:ROBOT.STATUS

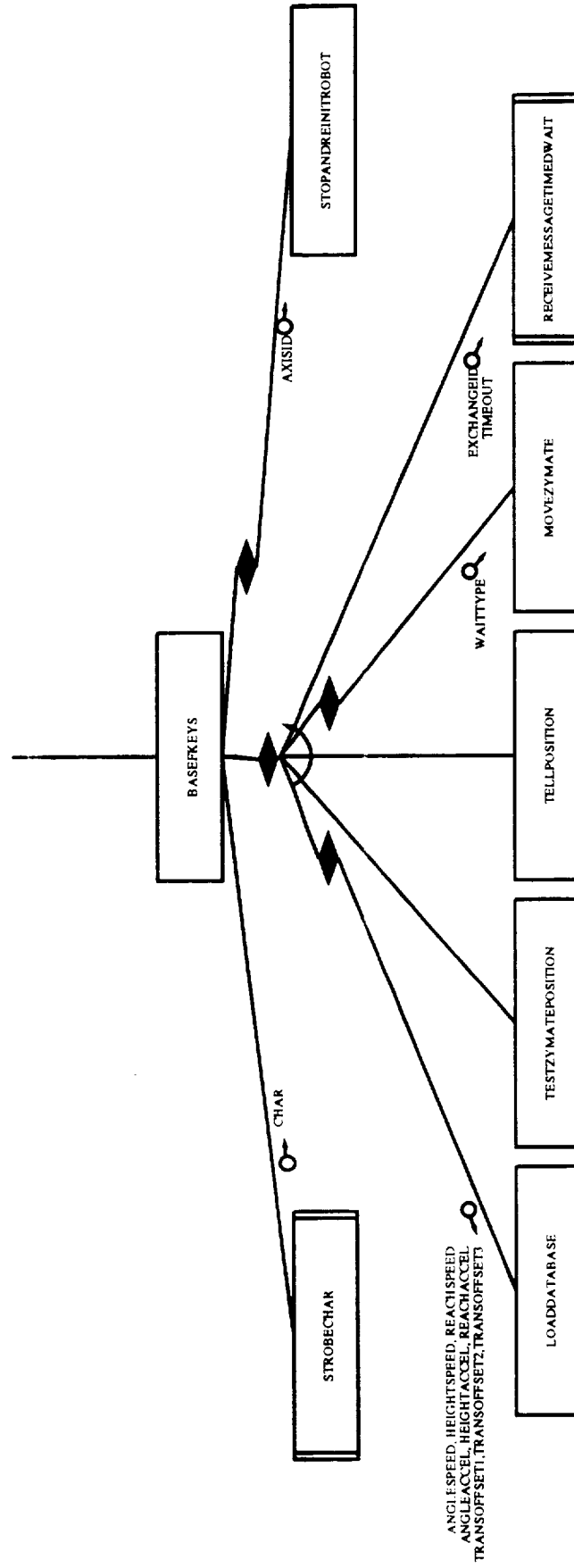
1	Hard Abort
2	User Stop
3	Robot/Xp Communication Error
4	End Of Travel Fault
5	Overforce Fault
6	Velocity Anomaly fault
7	Base Axis fault
8	Gripper fault
9	Robot cannot sign on
10	Robot version is not available
11	Invalid command
12	Command is not for this robot
13	Memory request denied
14	Dictionary entry does not exist
15	Dictionary entry already exists
16	Illegal rack index

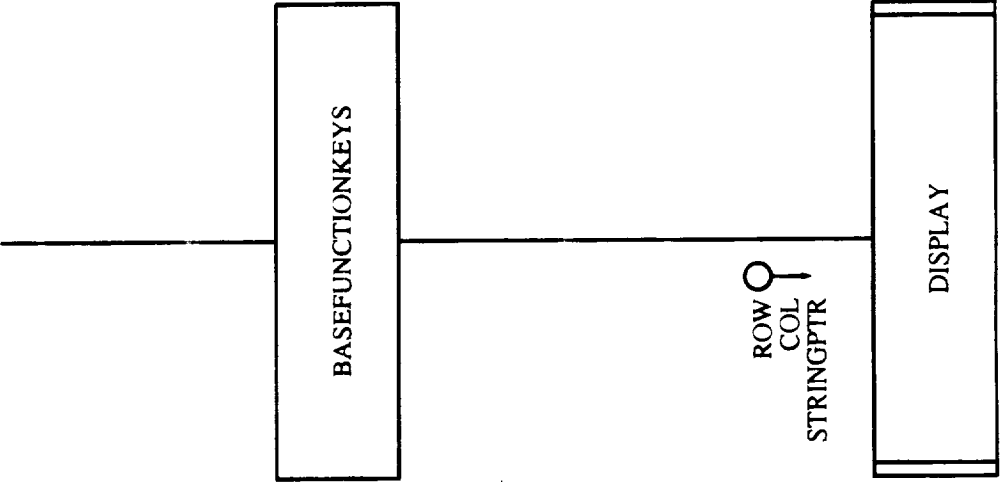
Robot Module Software Fault Handling Summary

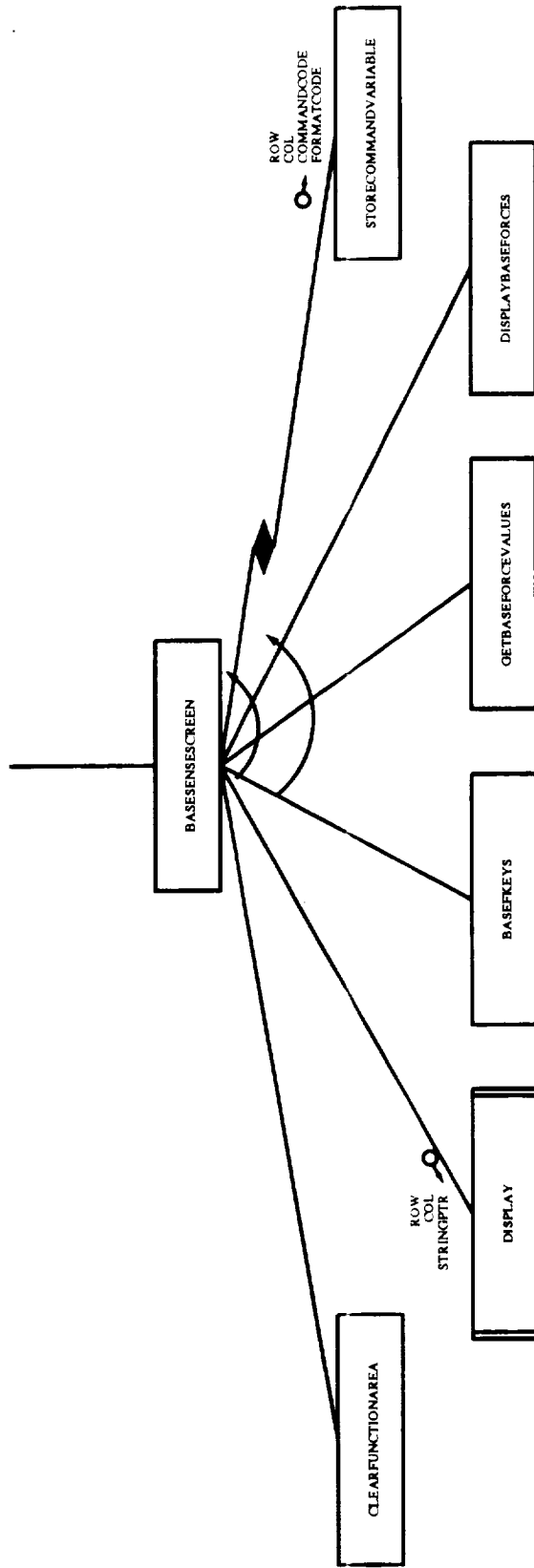
Fault Condition	Fault Detection	Fault Response
STOP EZC Processing	User presses STOP key OR System ISR updates EZC Processing status monitored by Robot Stop Task.	Robot Stop Task sends "STOP ROBOT" command to XP Servo Controller. Robot Task updates Error Status and terminates command.
Robot/XP Communication Error	Robot Task sends a message to the XP Servo Controller; XP Servo Controller sends a one byte error code in response.	Robot Task attempts to send the message until the retries are exhausted, then updates Error Status and terminates command.
End of Travel, Overforce, or Velocity Anomaly Fault	Robot Task sends a "READ LIMIT STATUS" message to the XP Servo Controller; XP Servo Controller sends three status bytes in response.	Robot Task updates Error Status and terminates command.
Axis Failed to Reach Position	Robot Task sends a "READ MOVE STATUS" message to the XP Servo Controller; XP Servo Controller sends one status byte in response.	Robot Task updates Error Status and terminates command.
Invalid Command	Robot Task compares Command Code to valid Command Codes.	Robot Task updates Error Status and terminates command.
Command Is Not For This Robot	Robot Task compares Command Module ID to it's own Module ID	Robot Task updates Error Status and terminates command.
Illegal Rack Index	Robot Task compares the Command Rack Index with the number of rows multiplied by the number of columns in the rack.	Robot Task updates Error Status and terminates command.

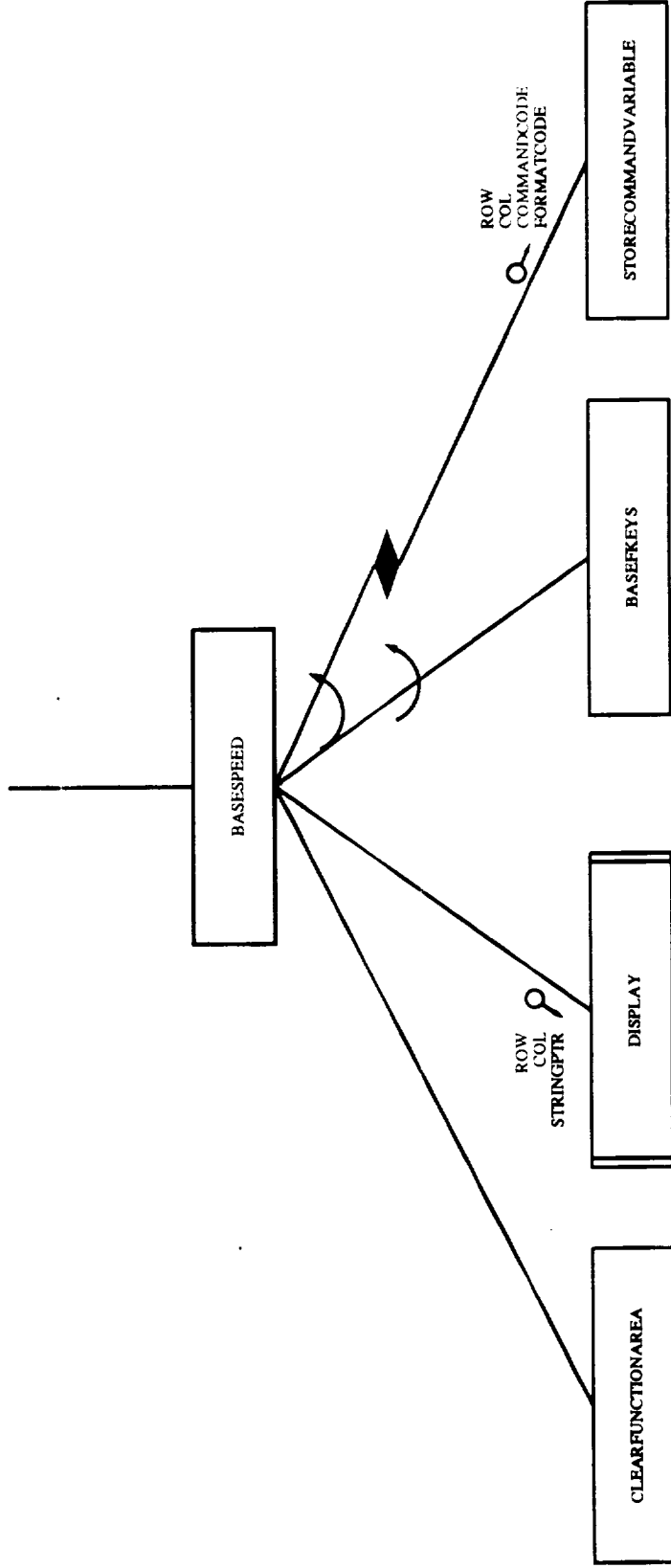
ROBOT MODULE STRUCTURE CHARTS

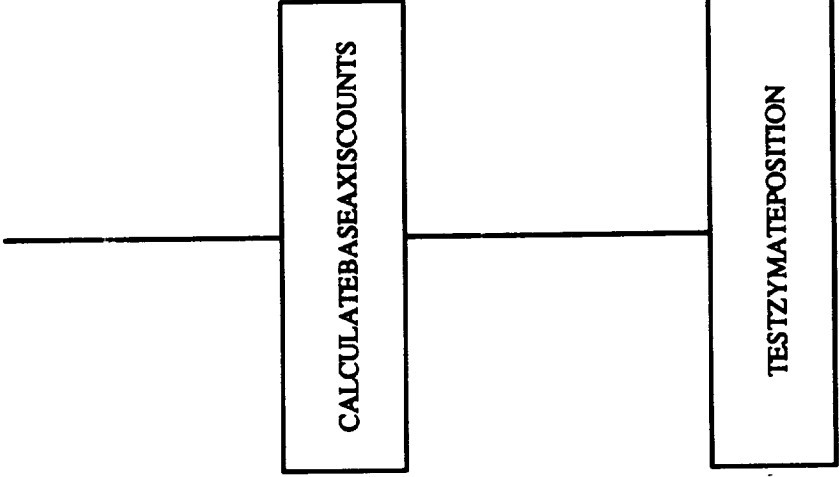


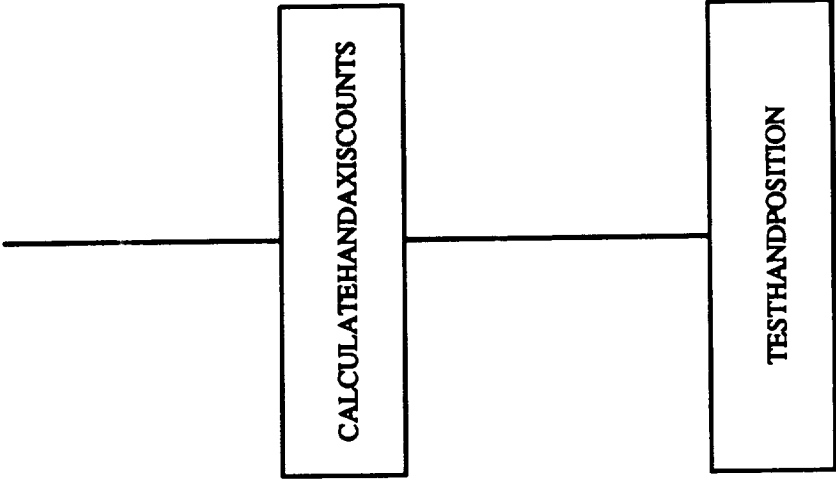


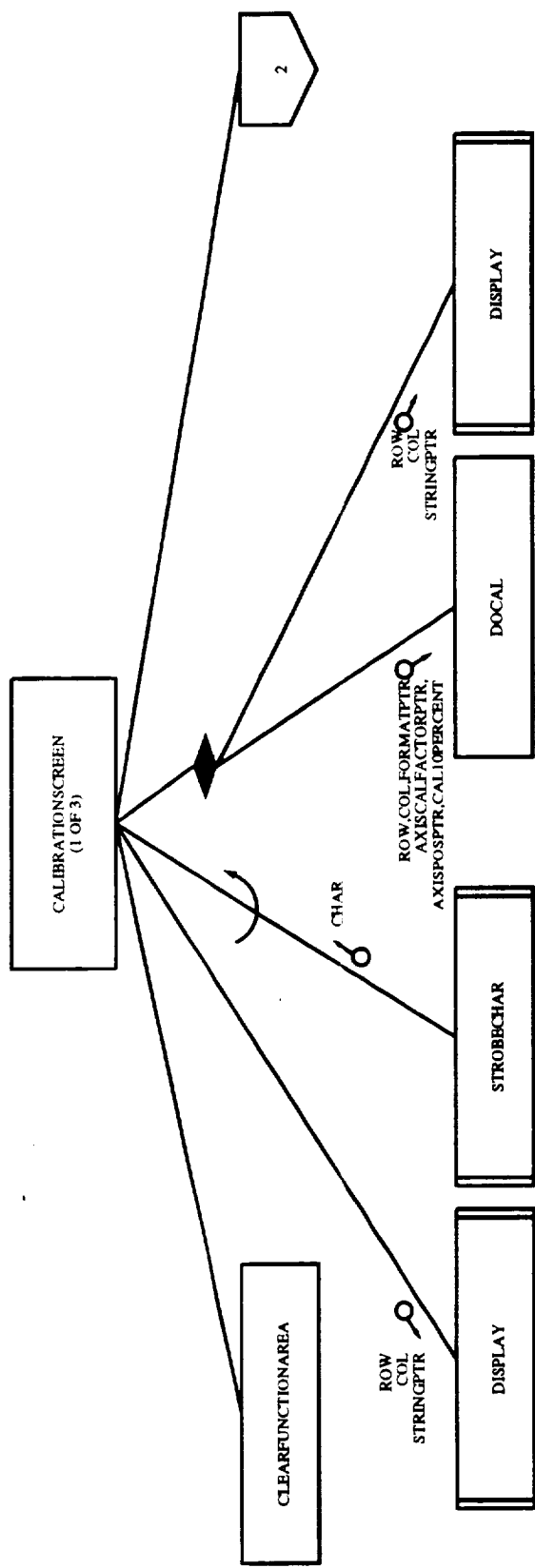


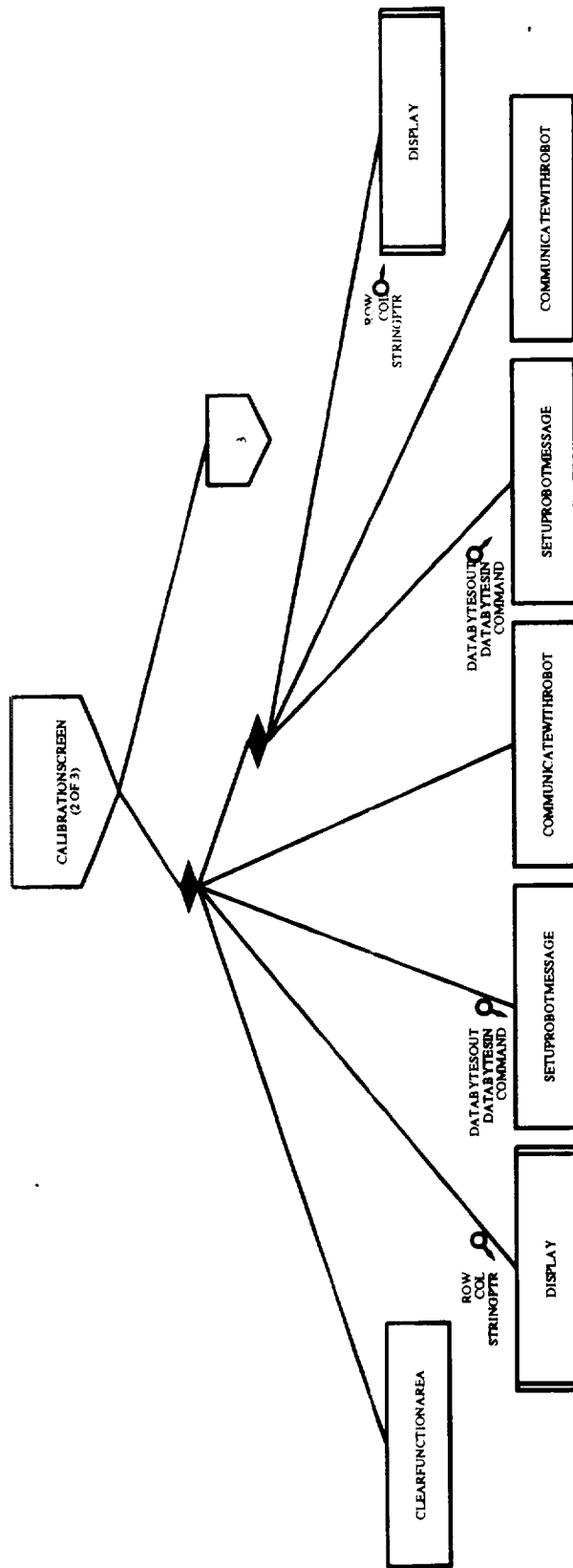


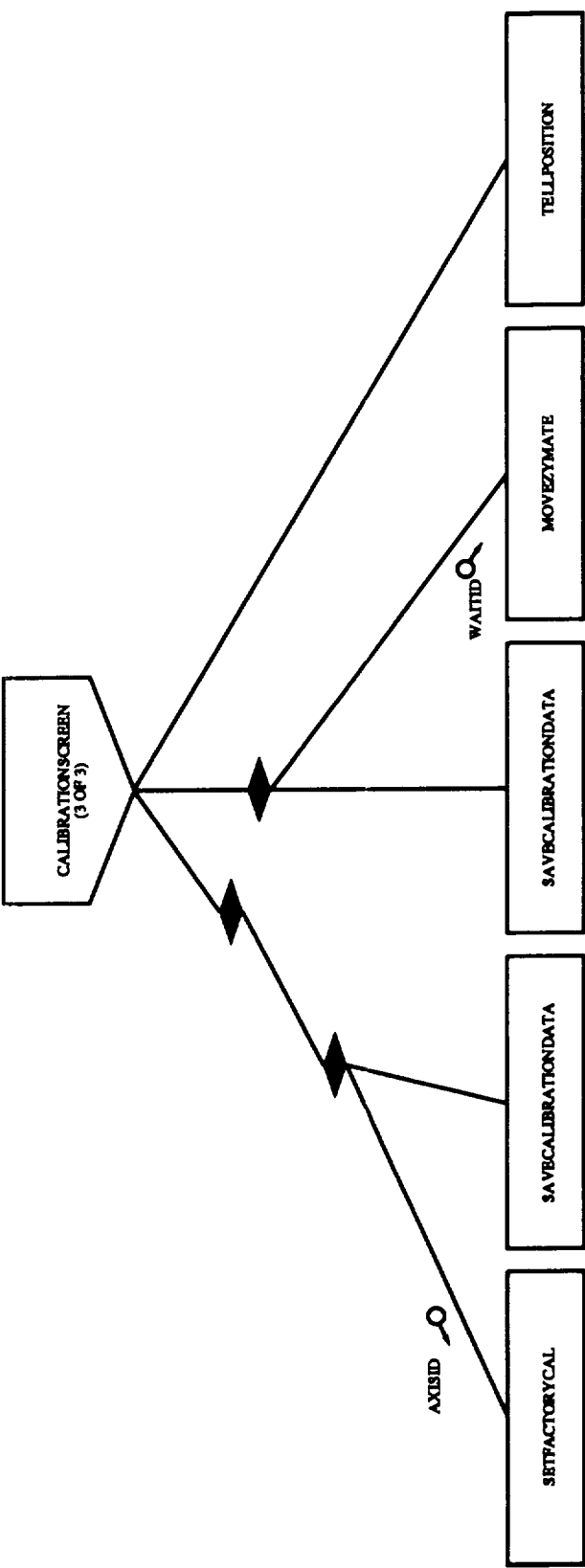


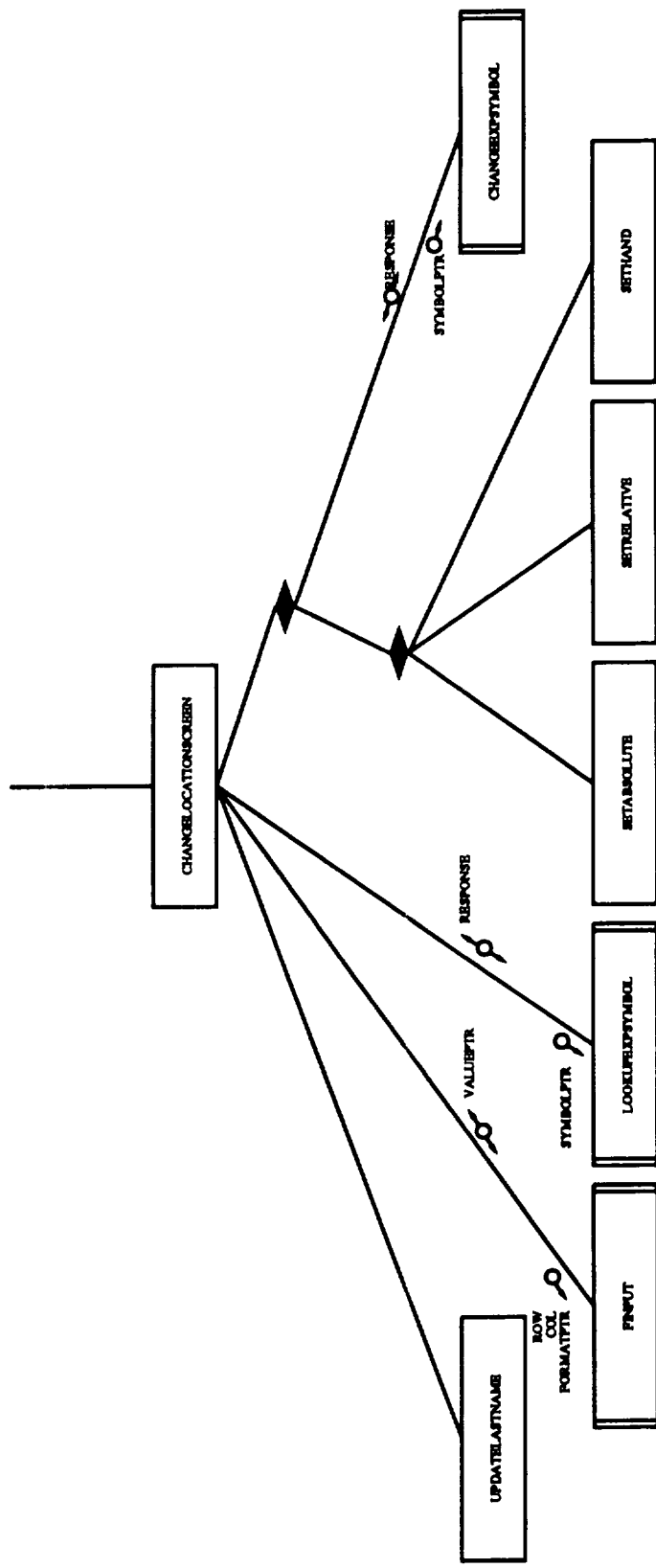


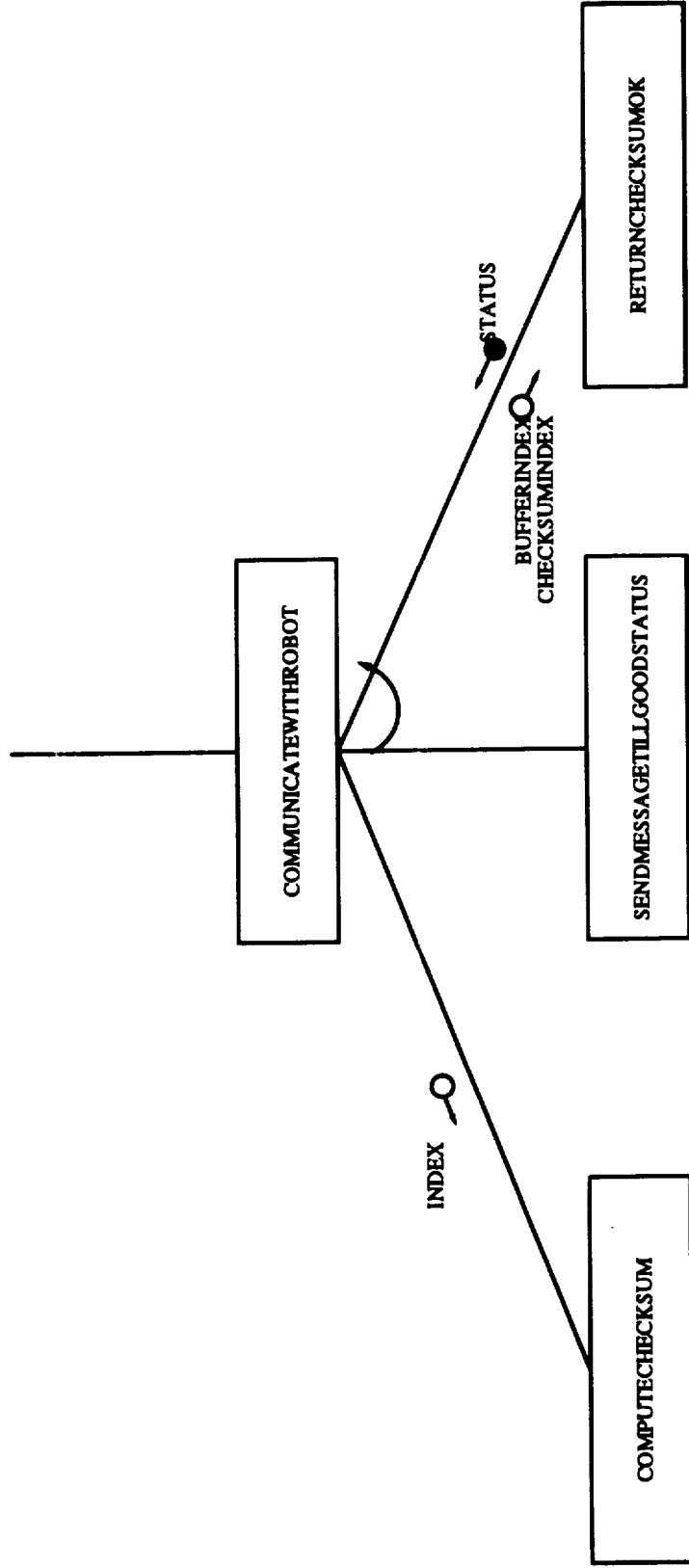












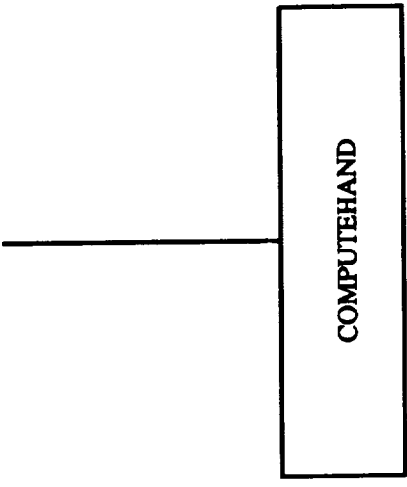
COMPUTEABSOLUTE



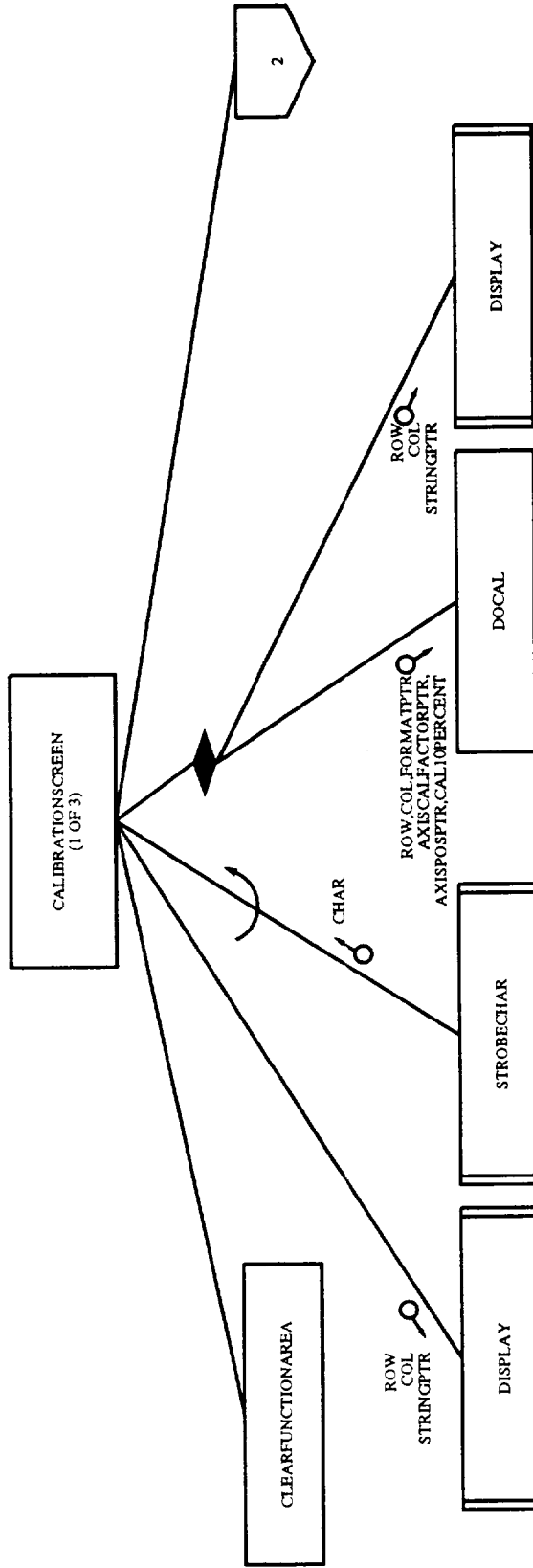
```
graph LR; A[COMPUTEABSOLUTE] --- B[ ]
```

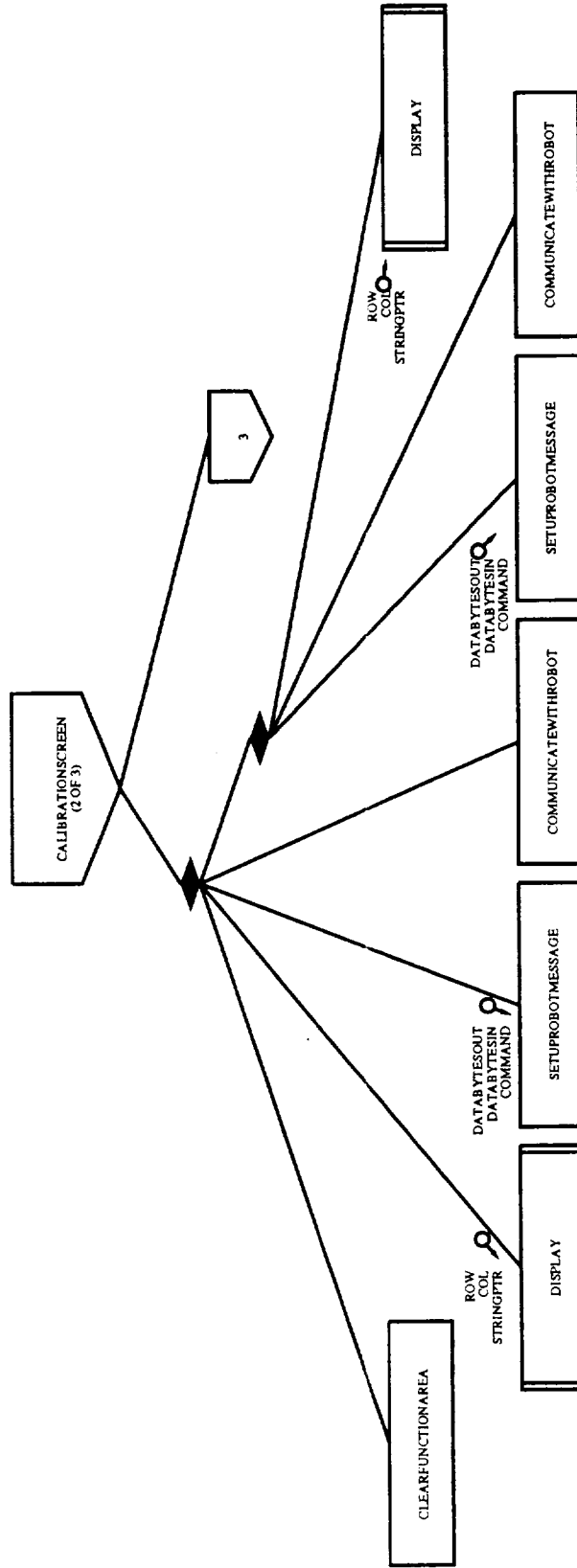
INDEX

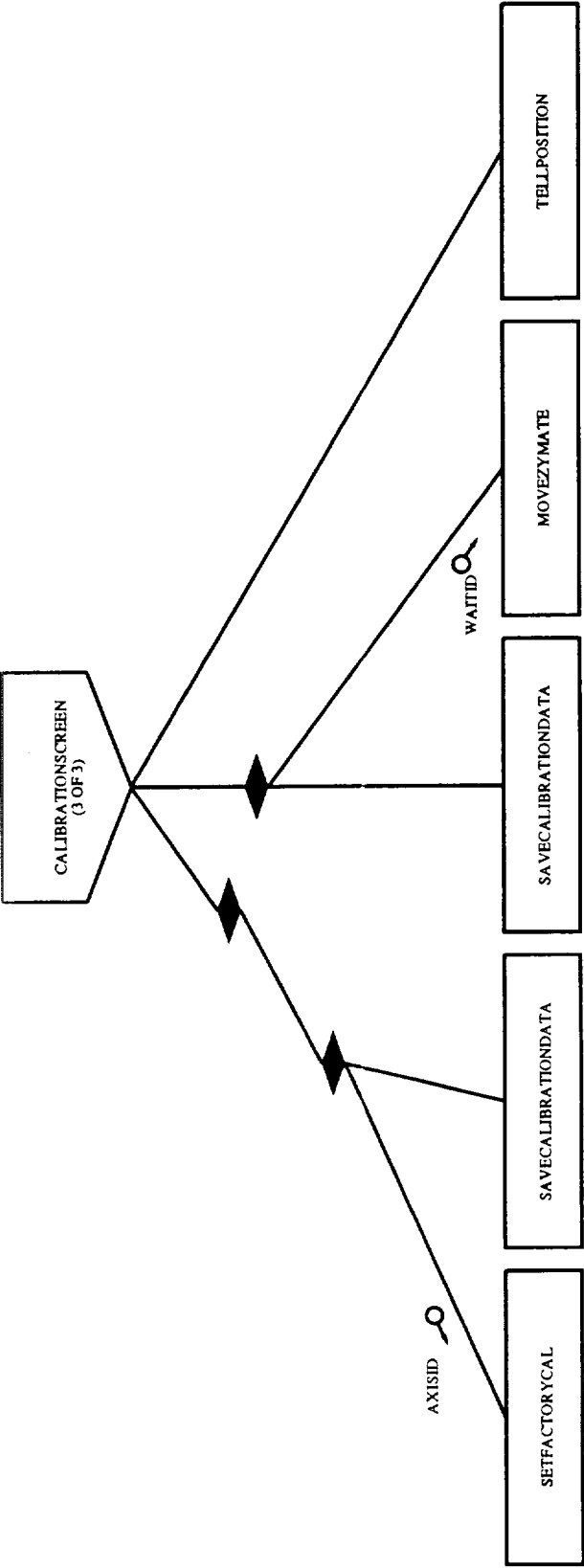
COMPUTECHECKSUM

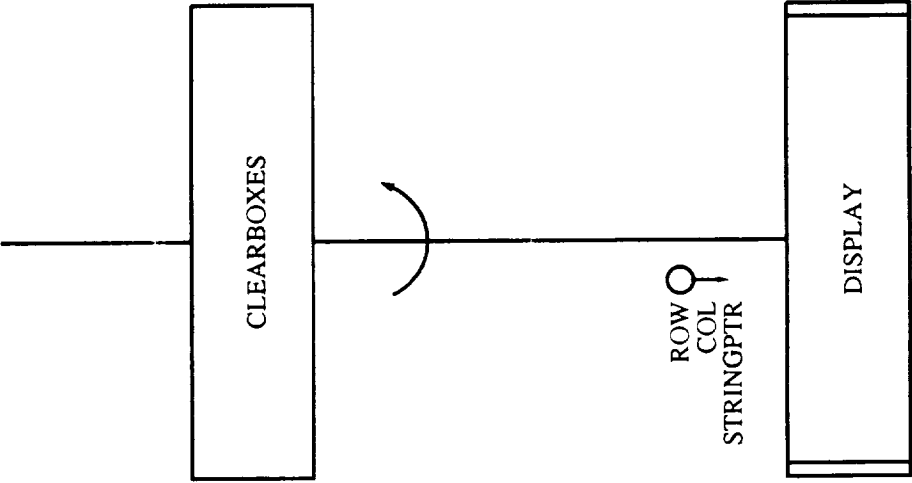


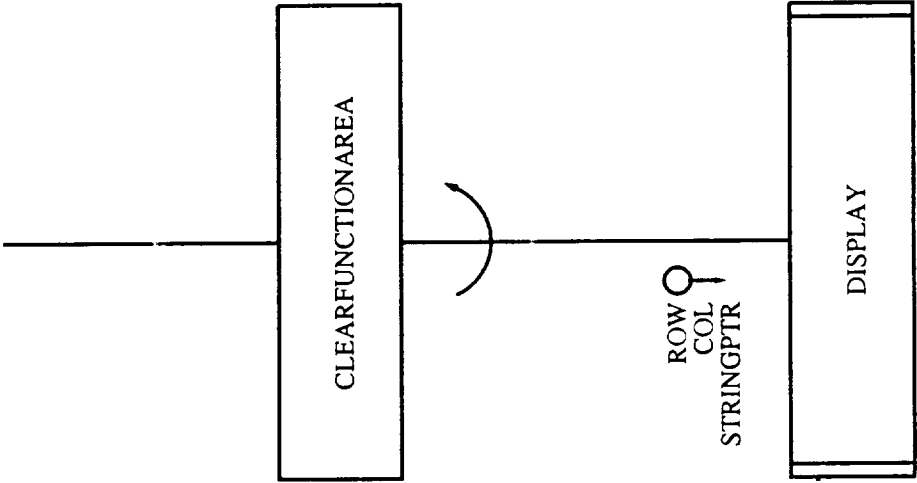
COMPUTERELATIVE

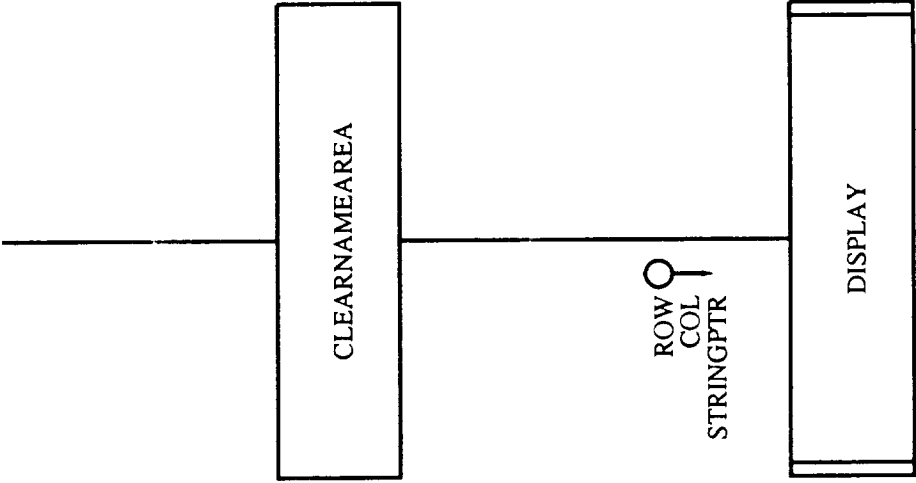


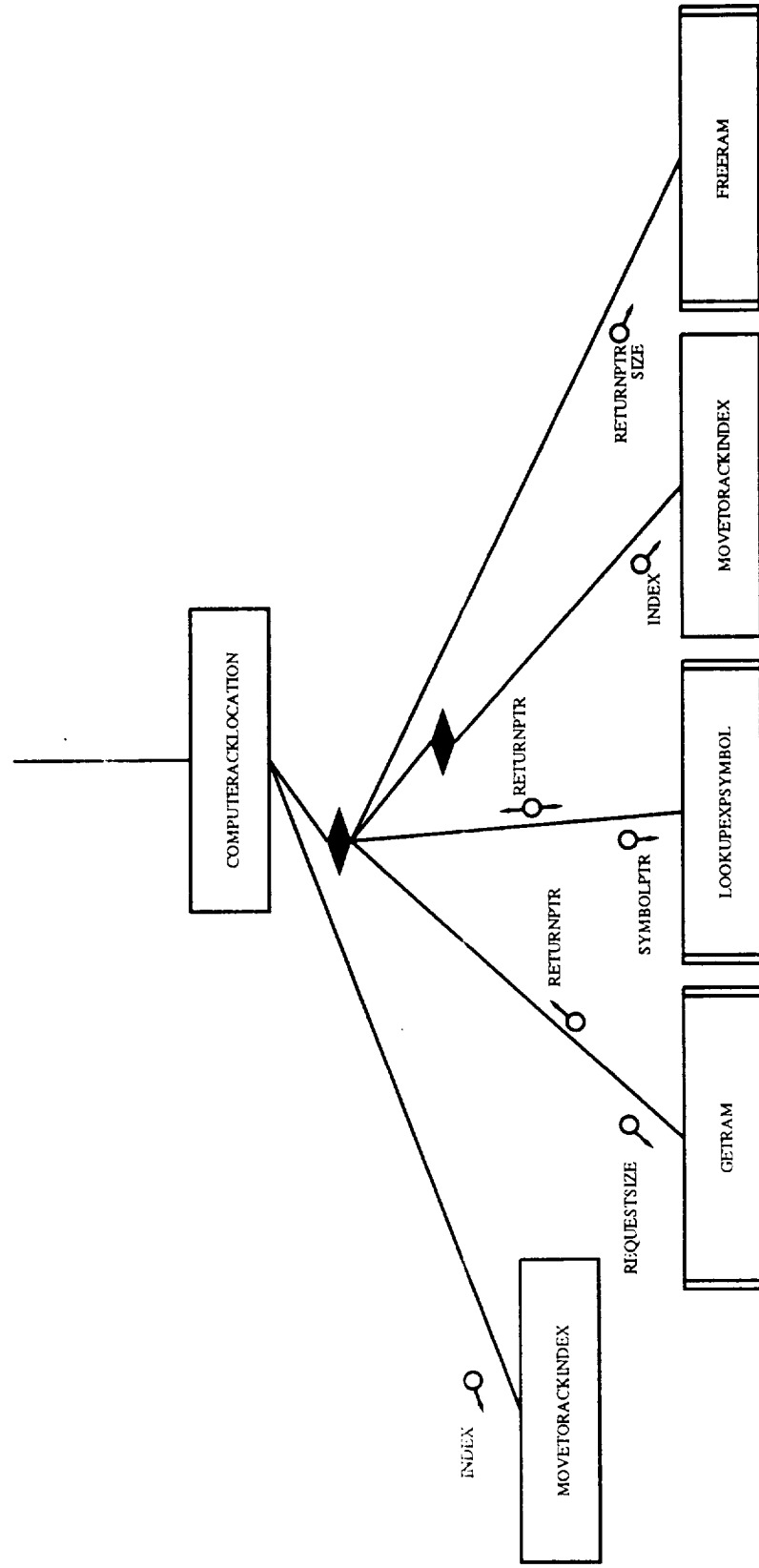


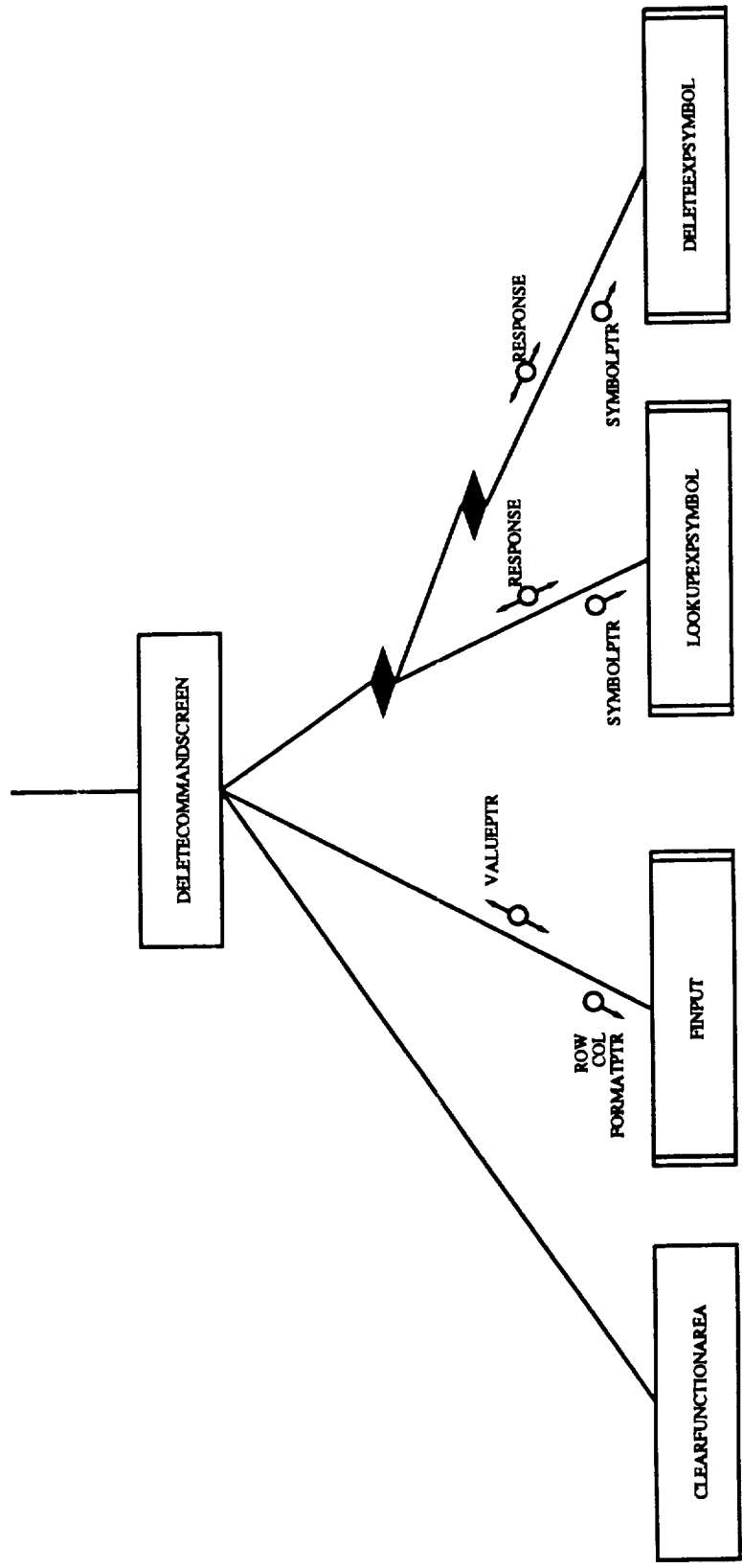


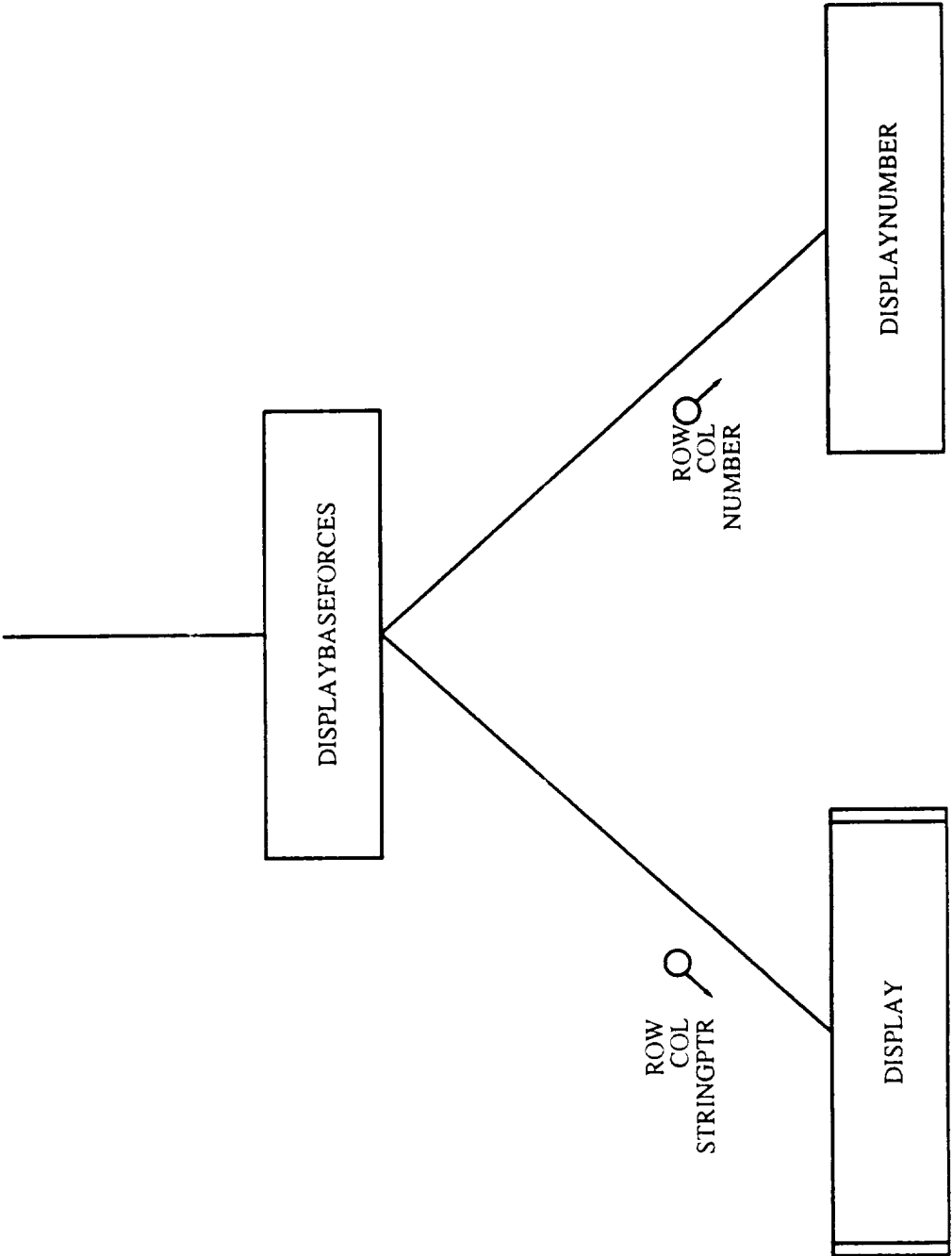


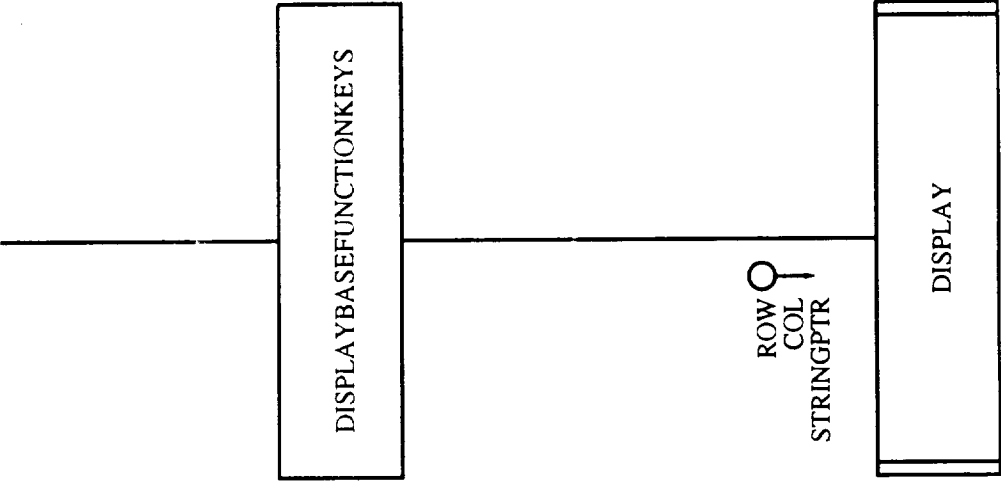


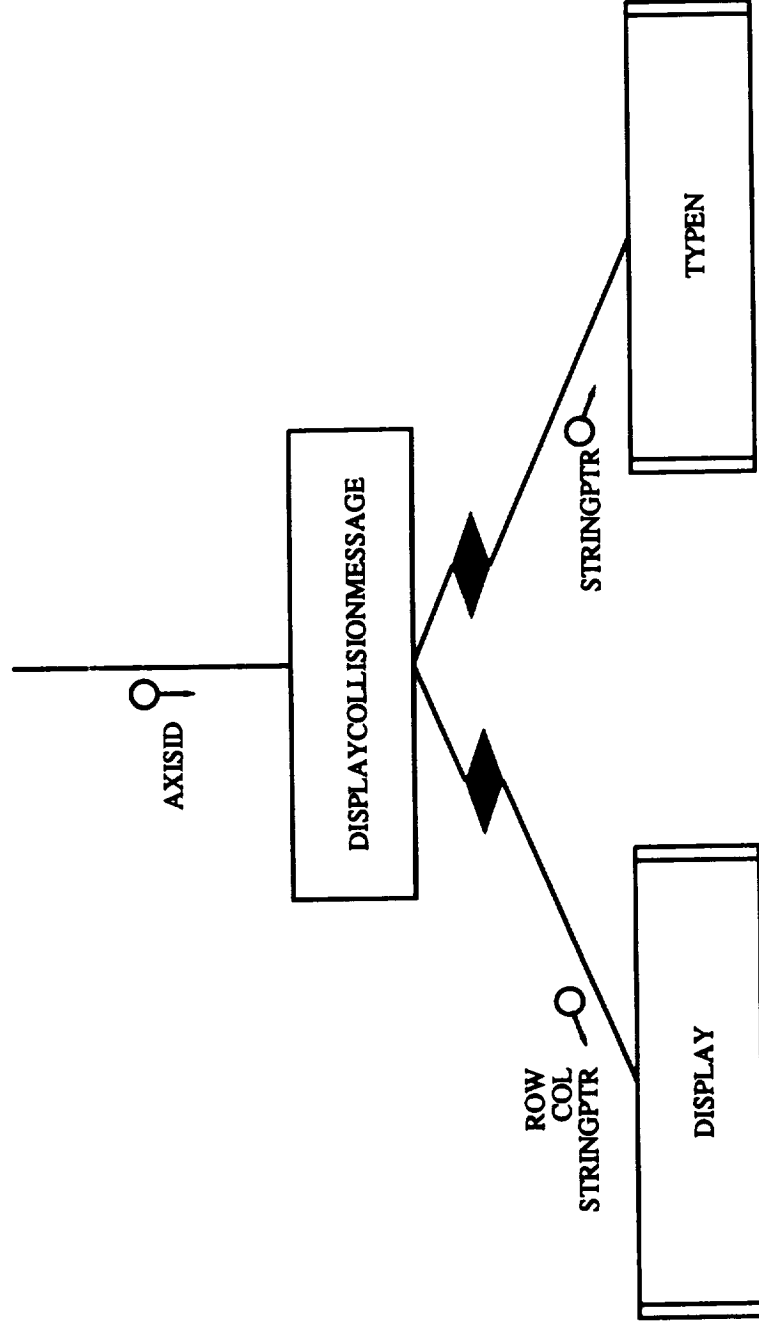


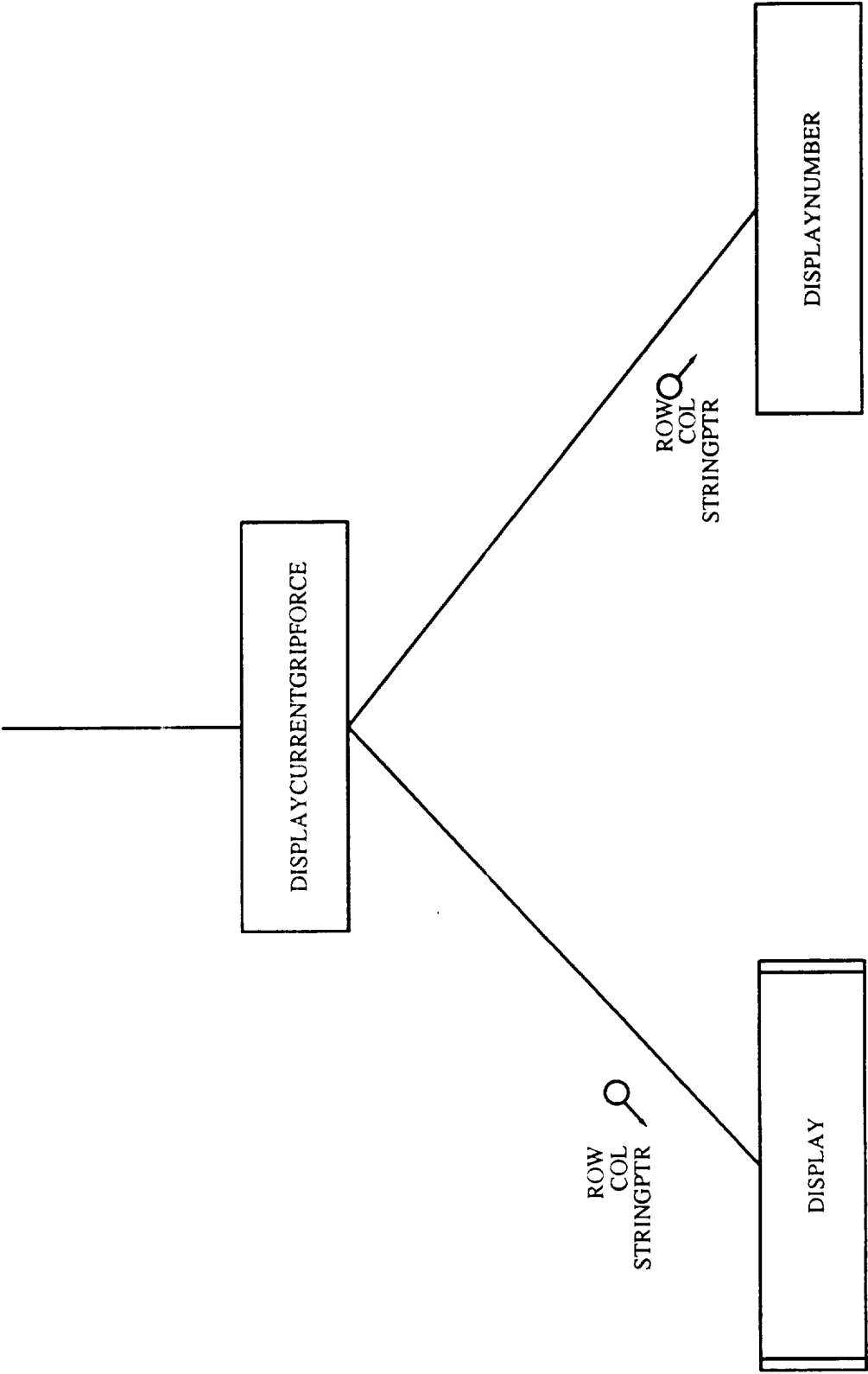


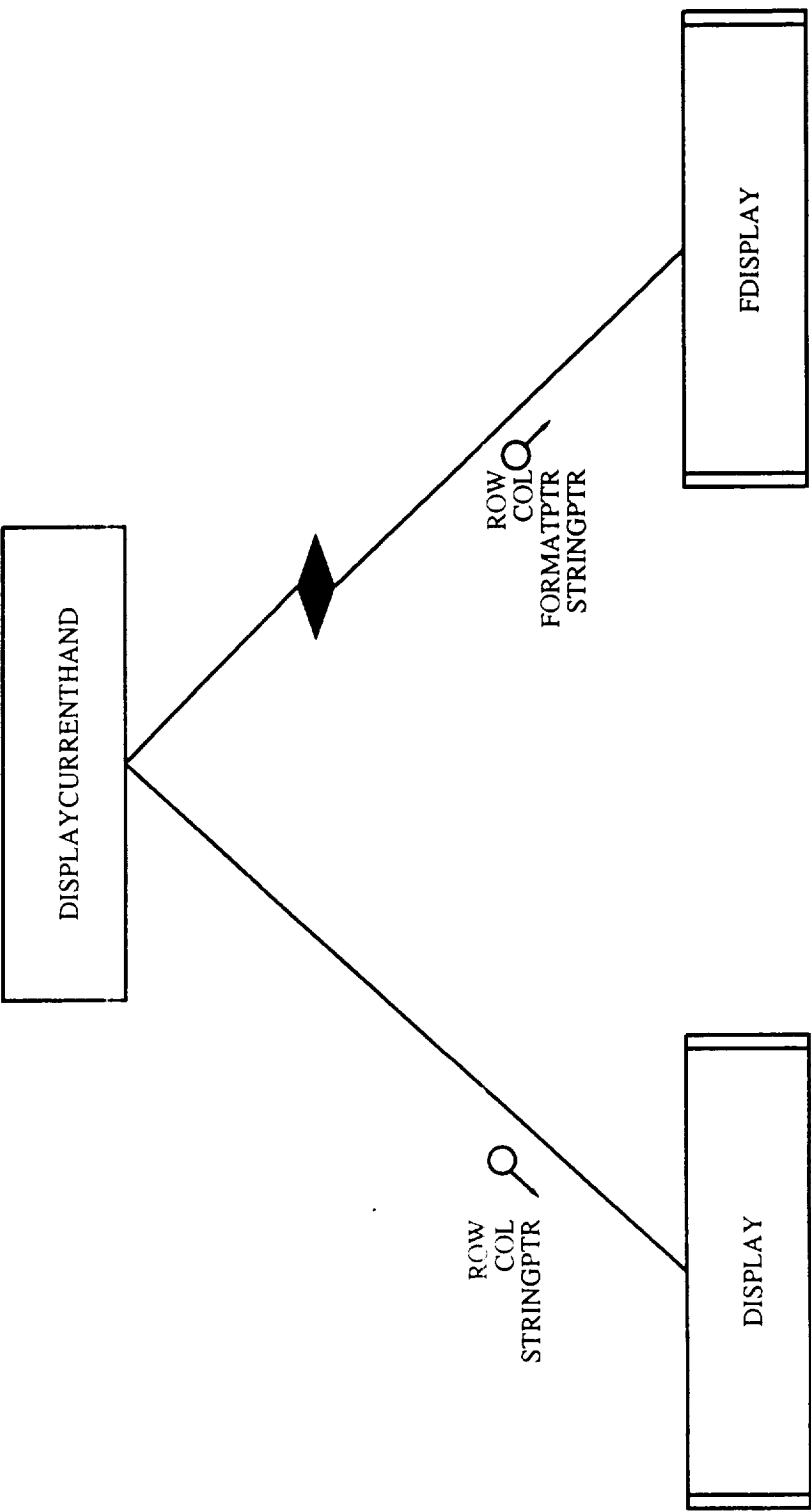


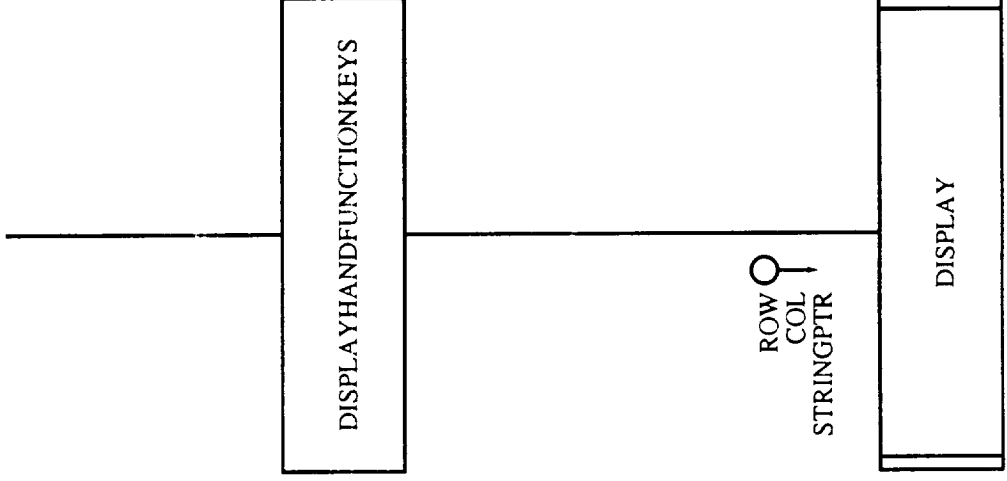


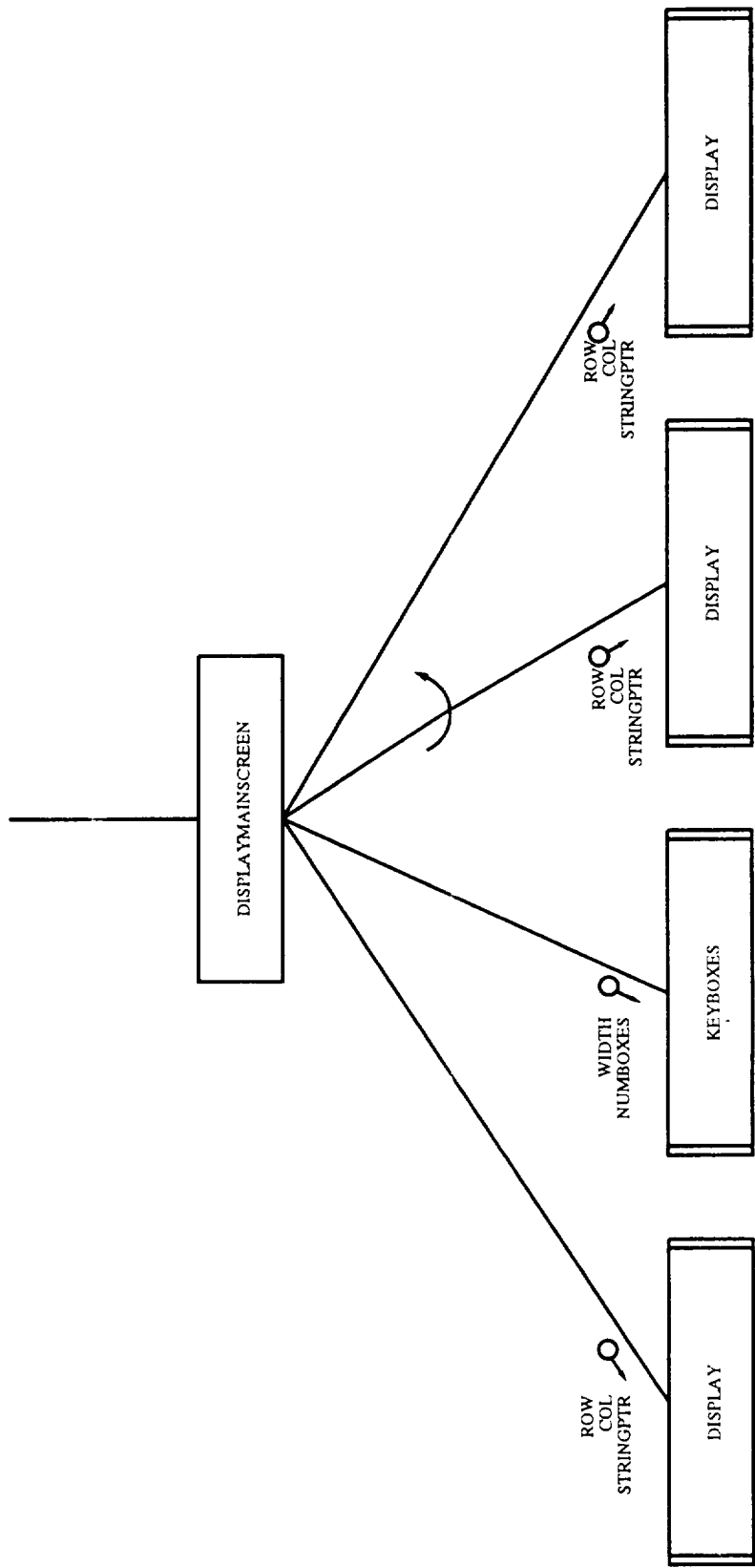


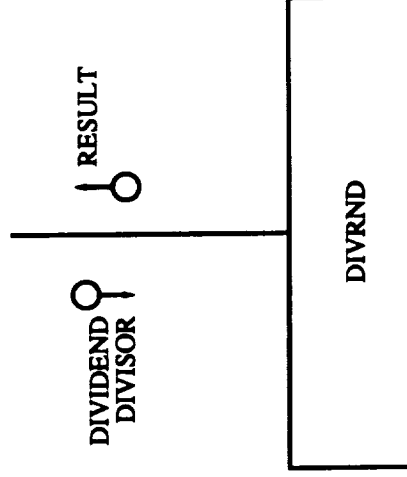


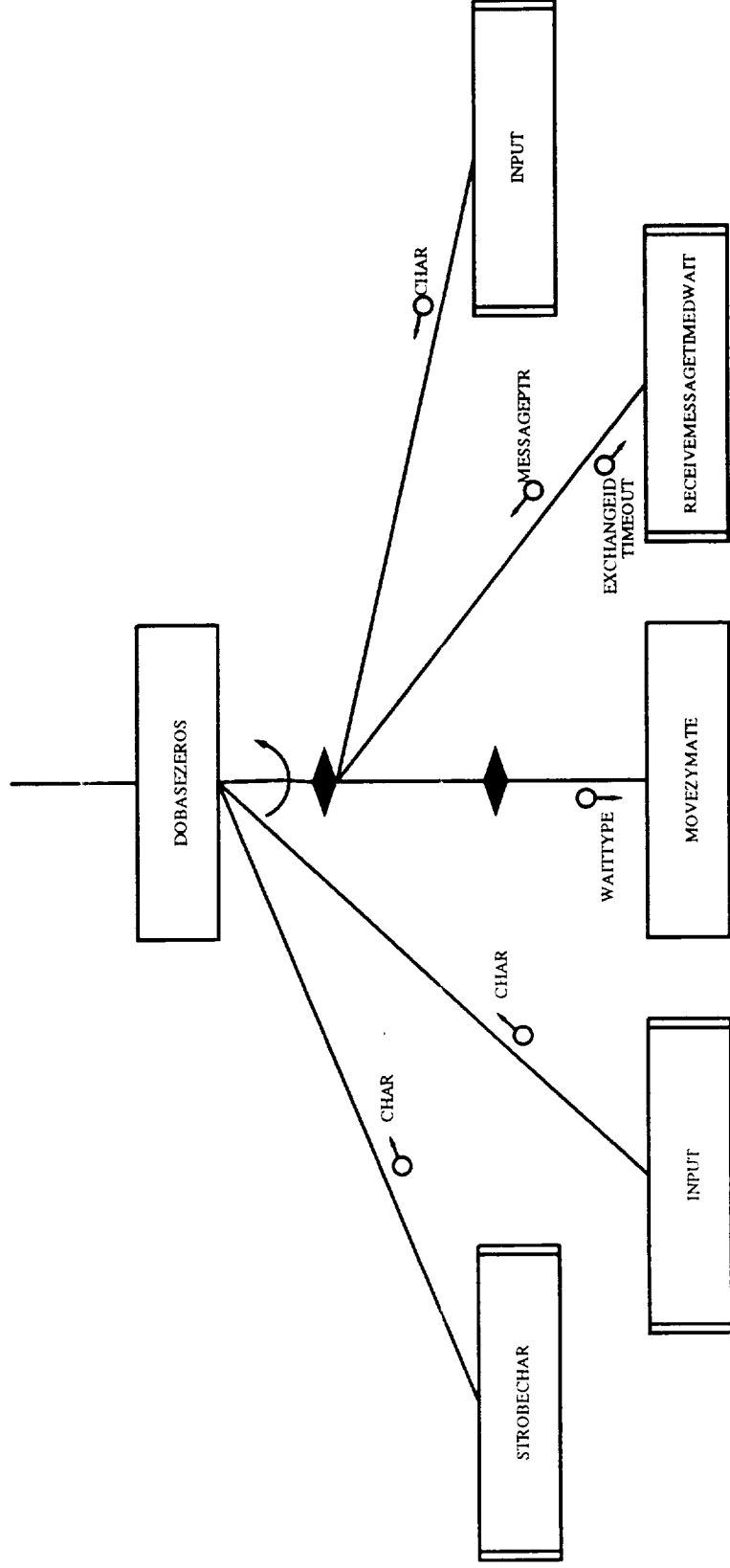


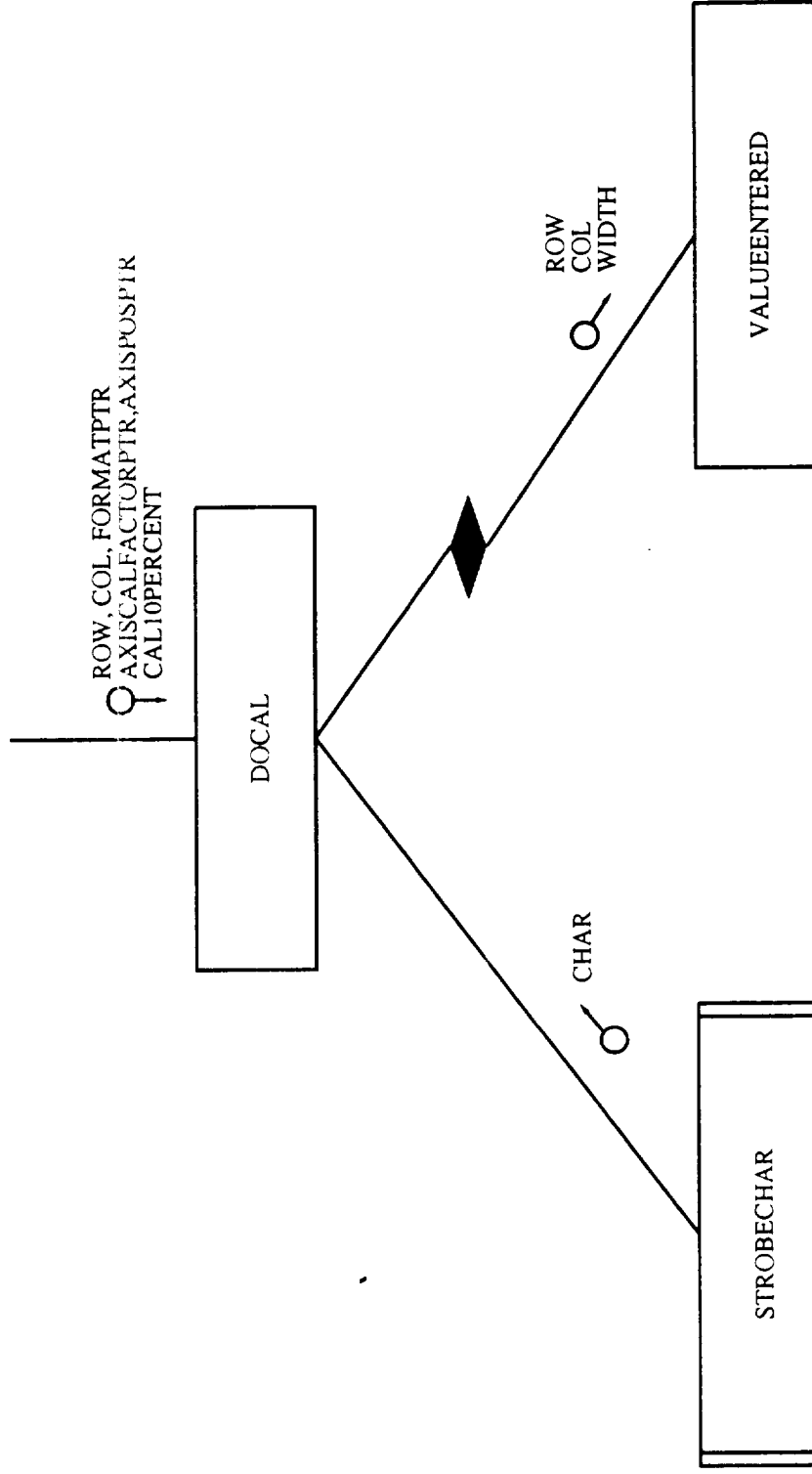


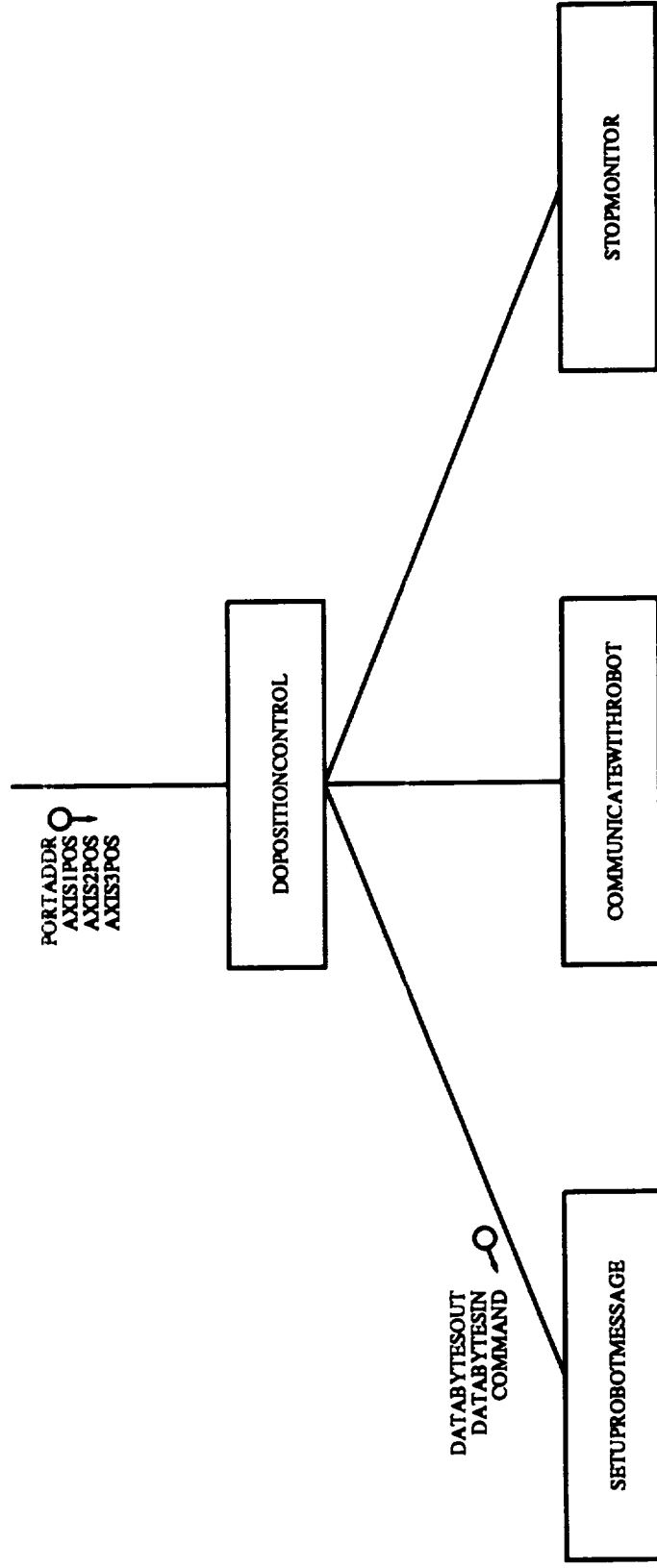


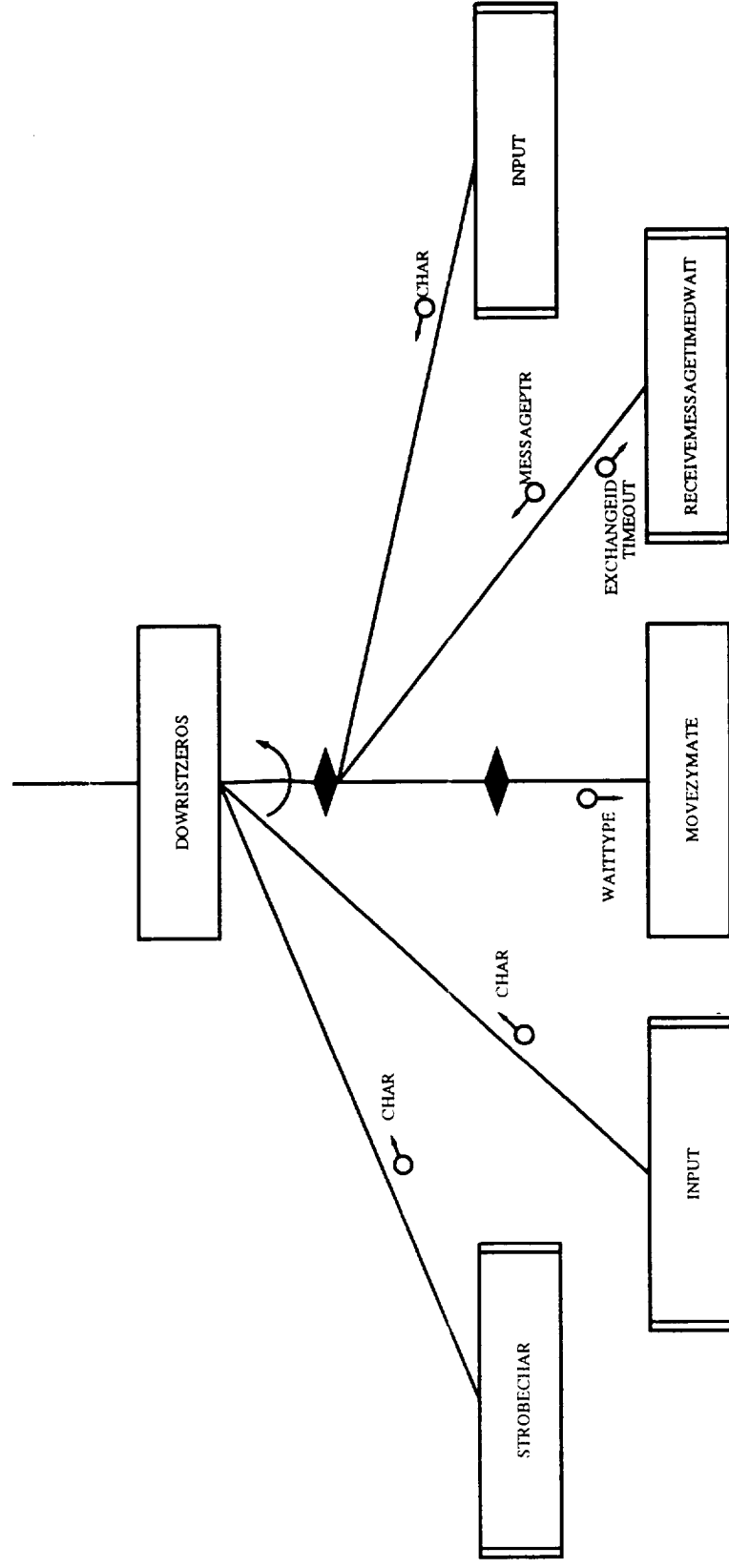


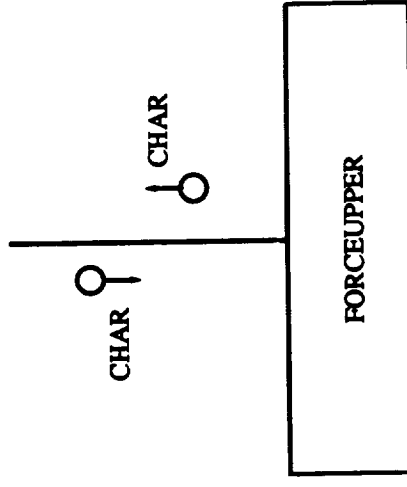


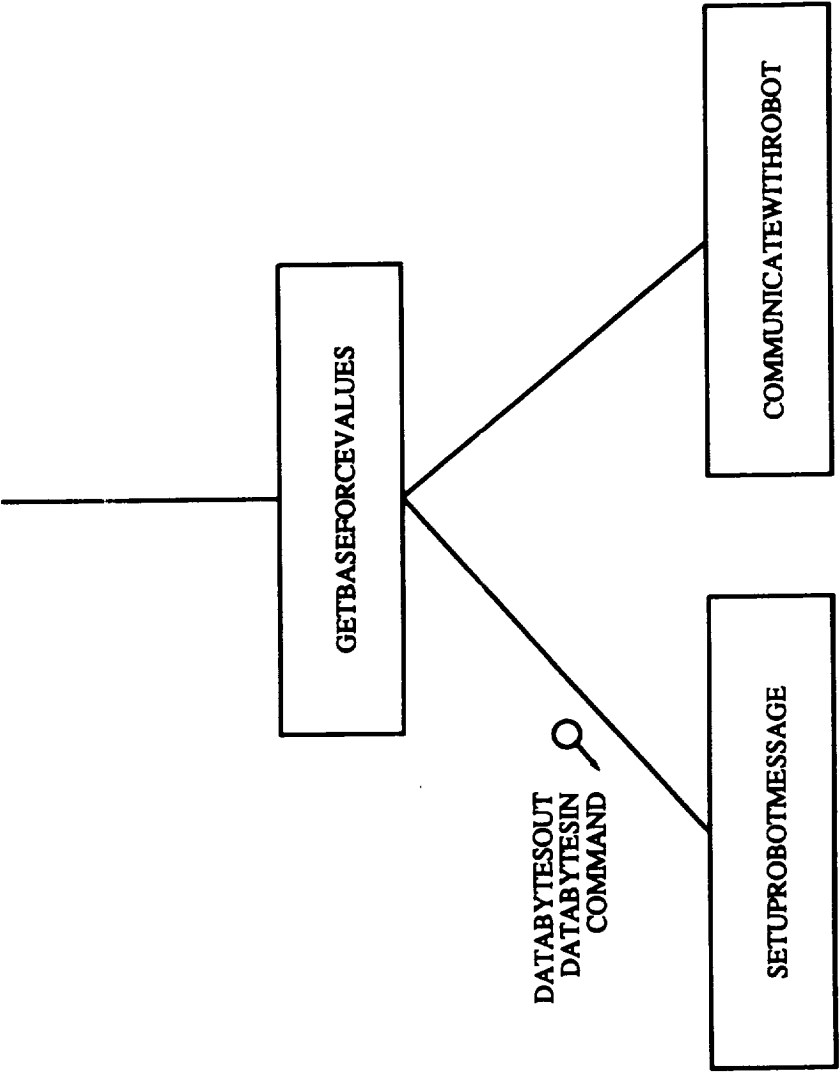


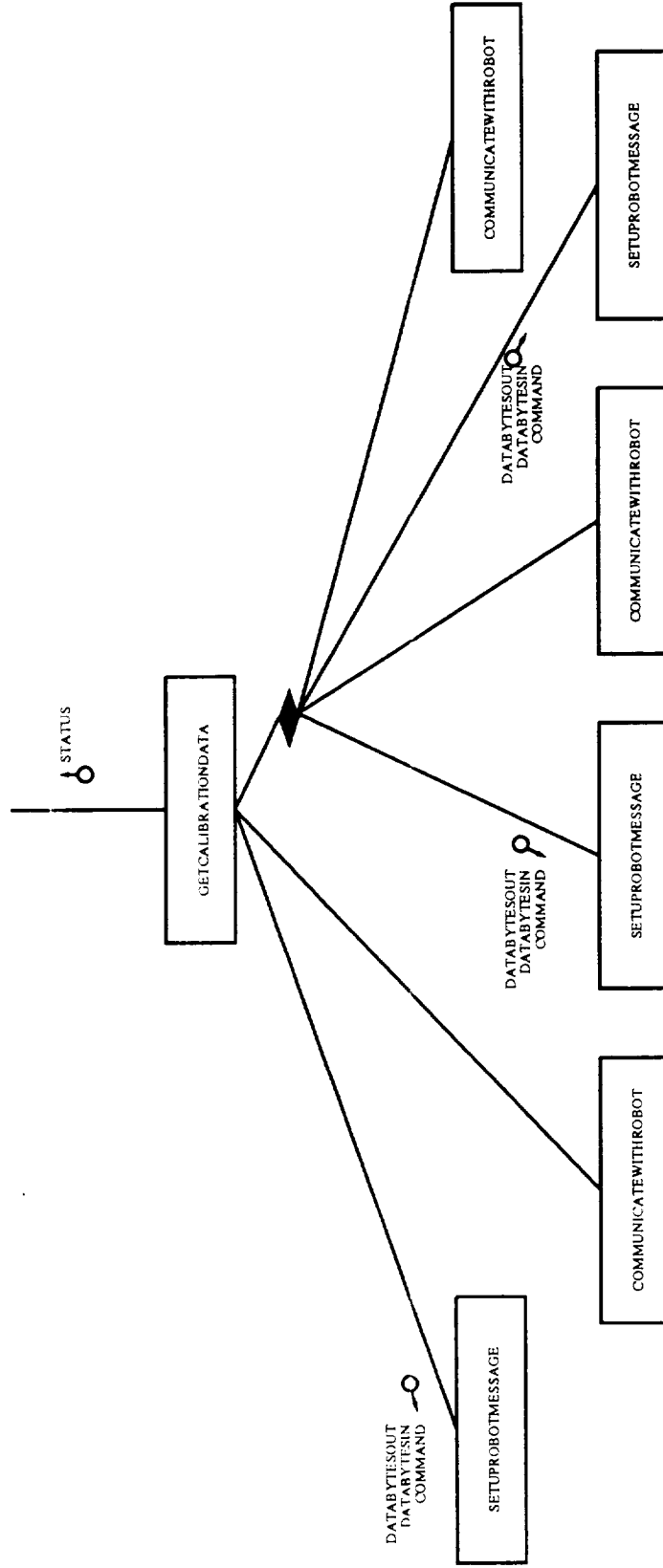




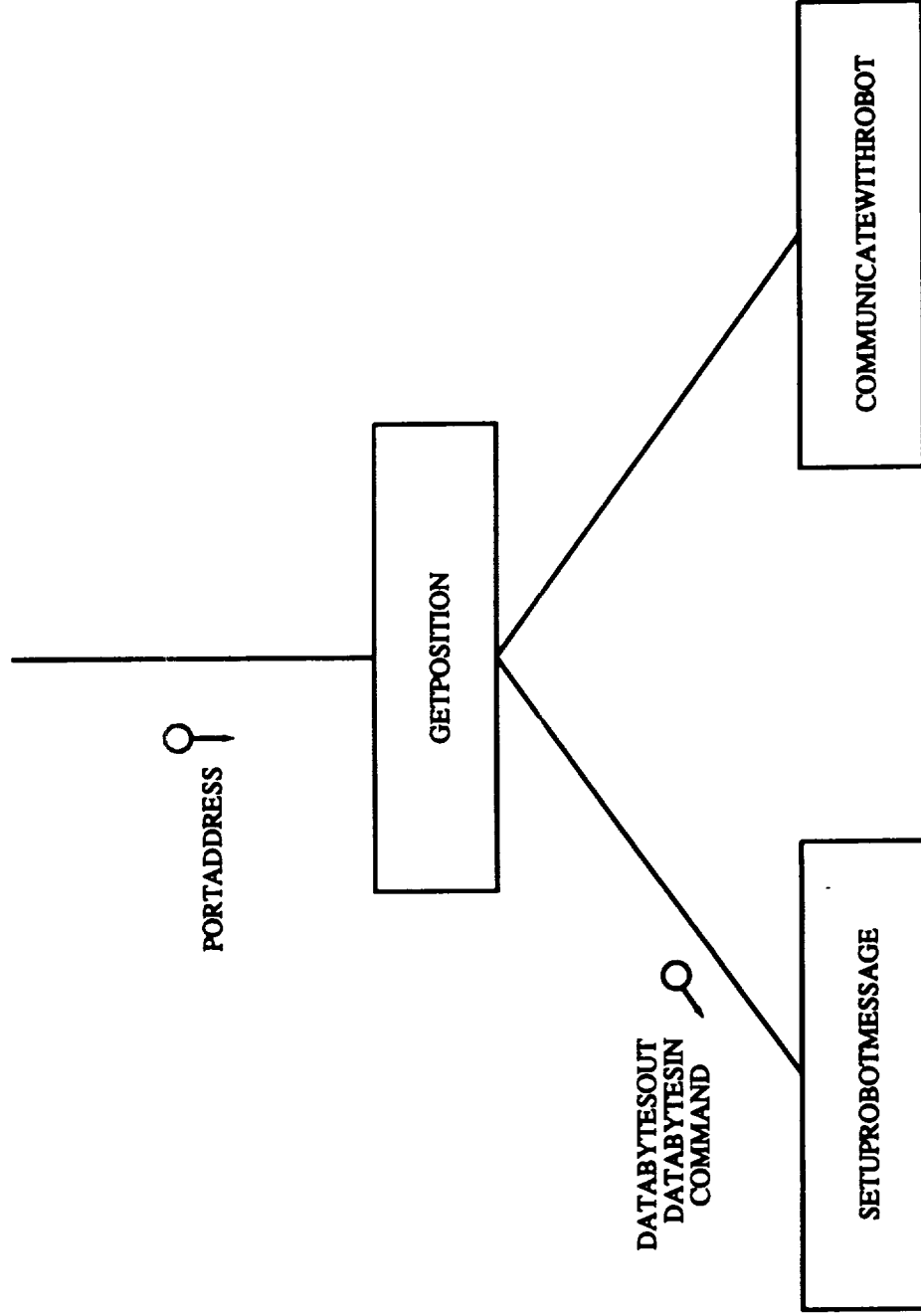


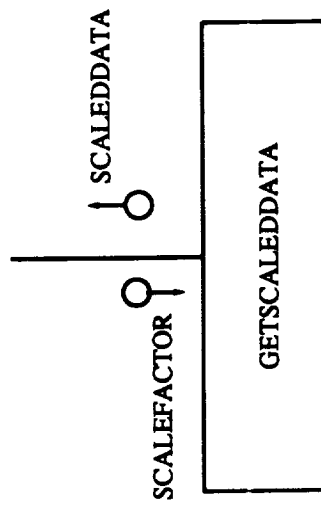


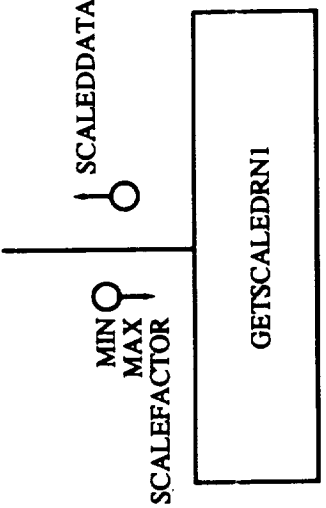


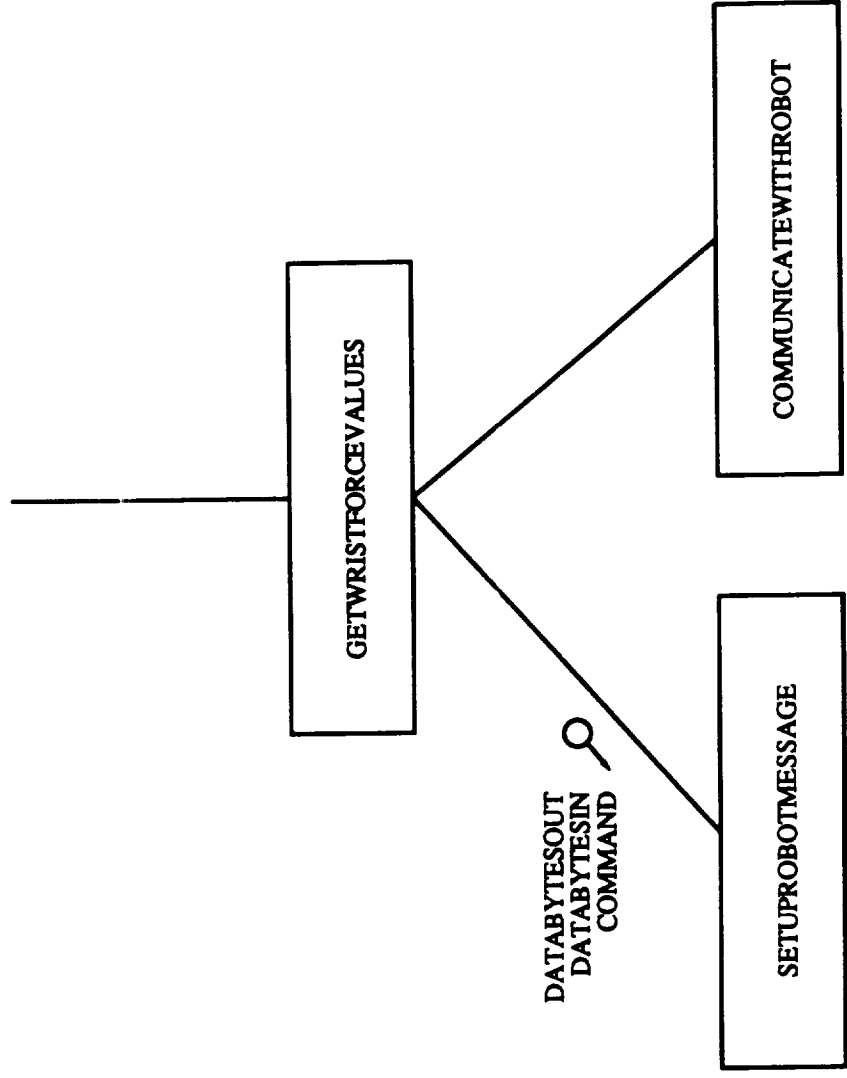


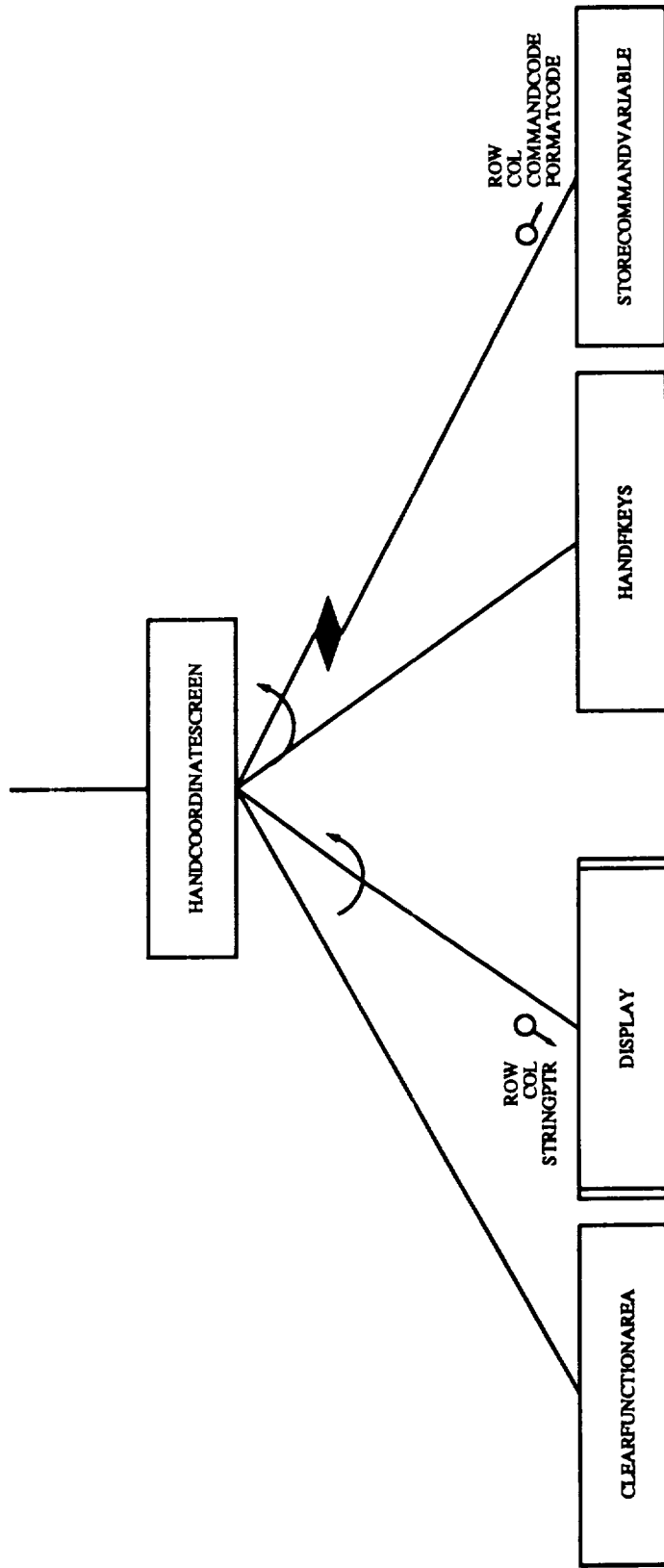
GETDICTIONARYHANDOFFSETS

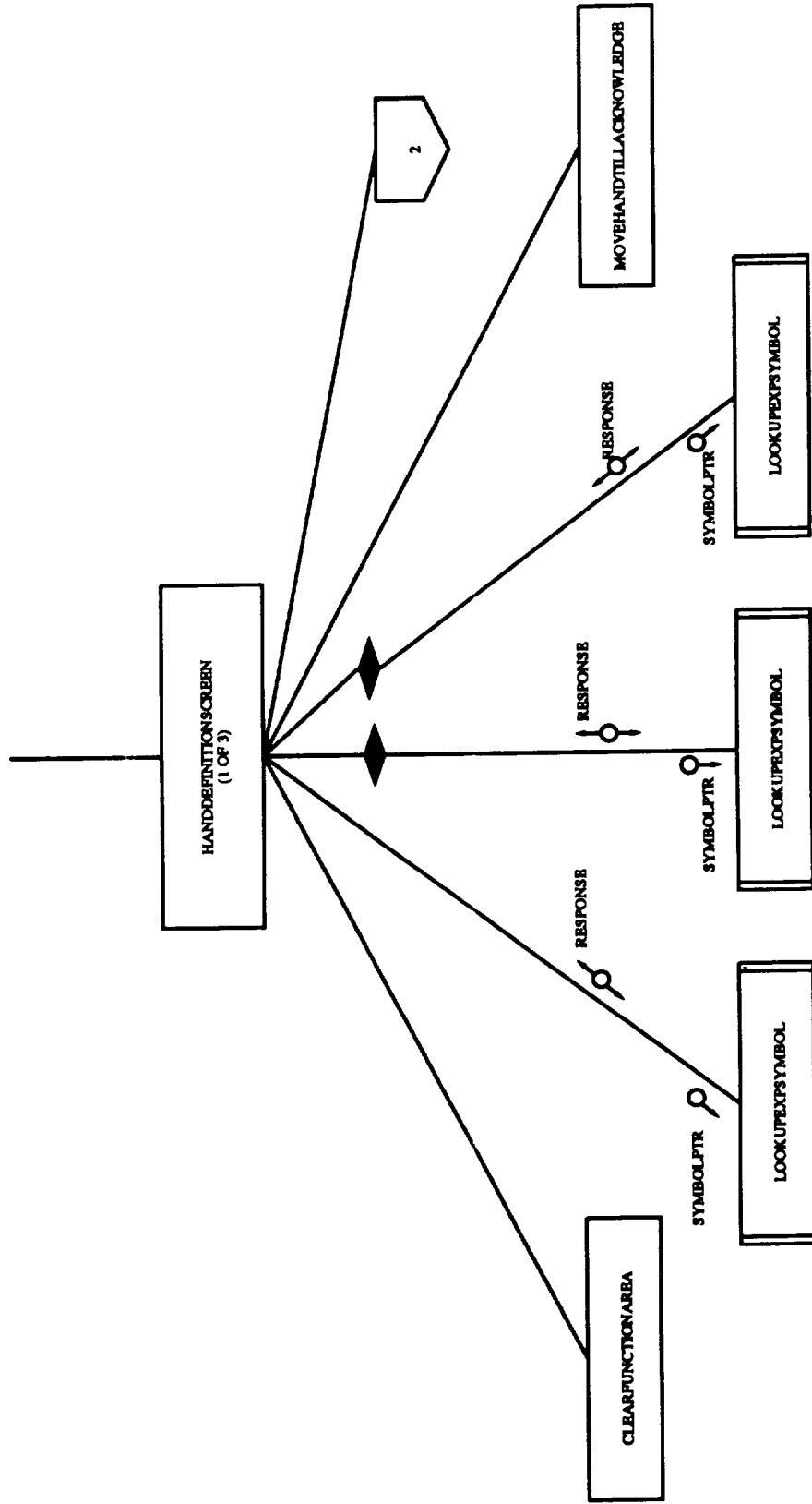


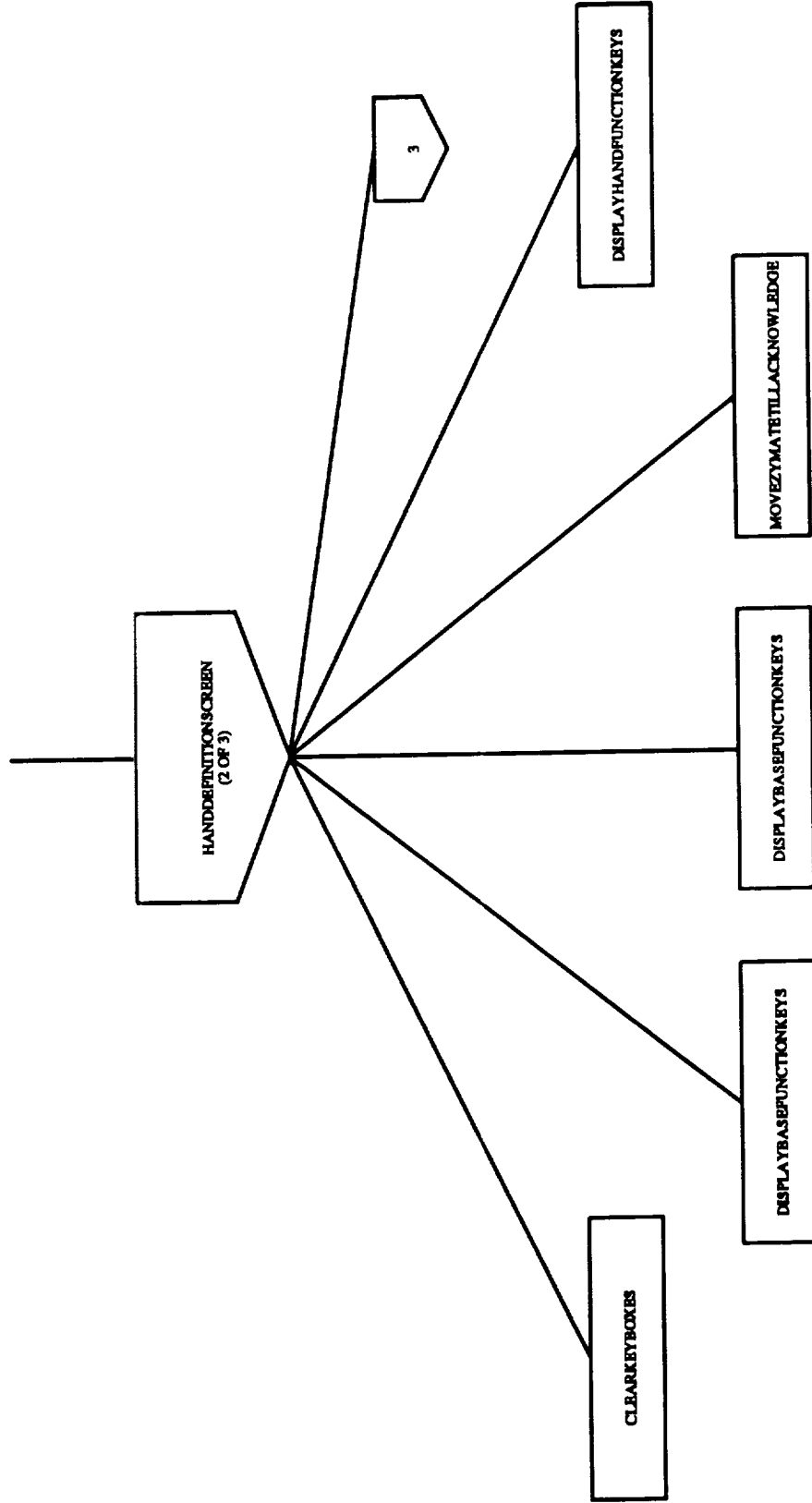


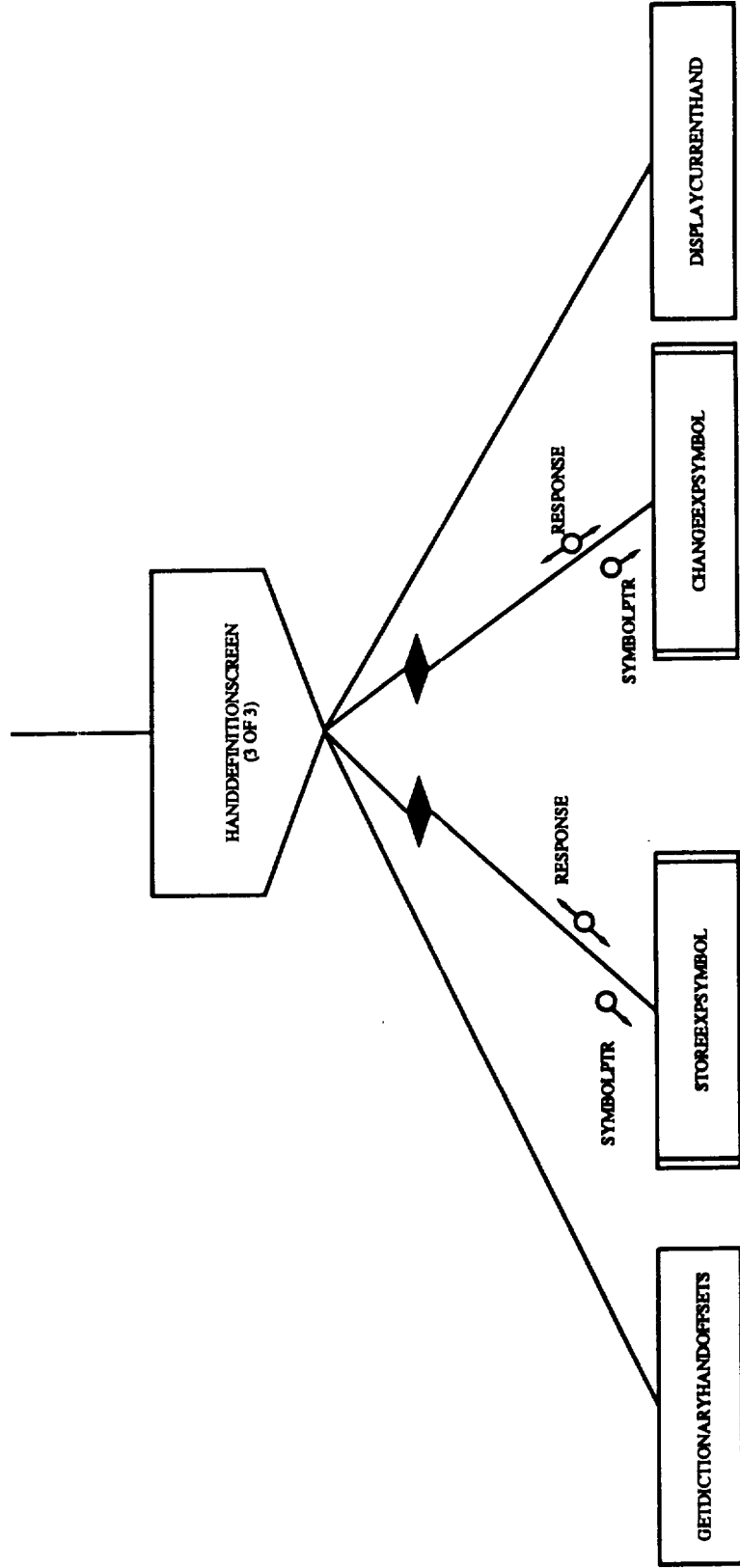


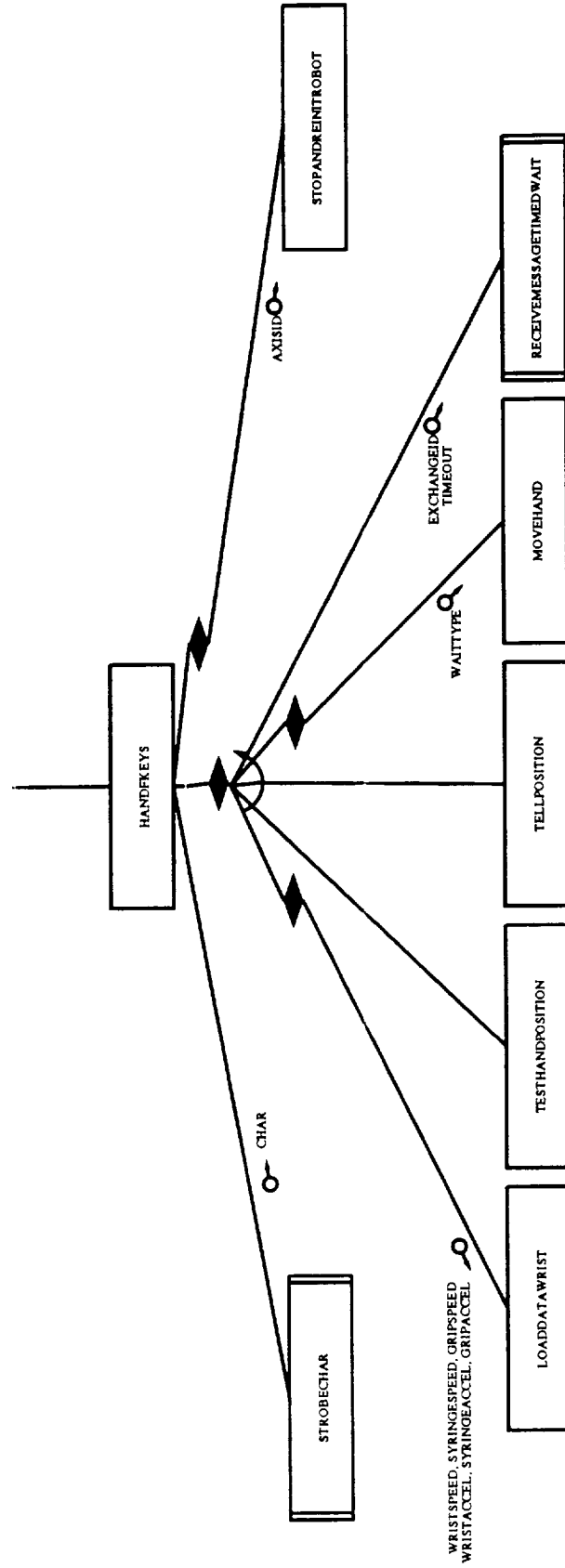


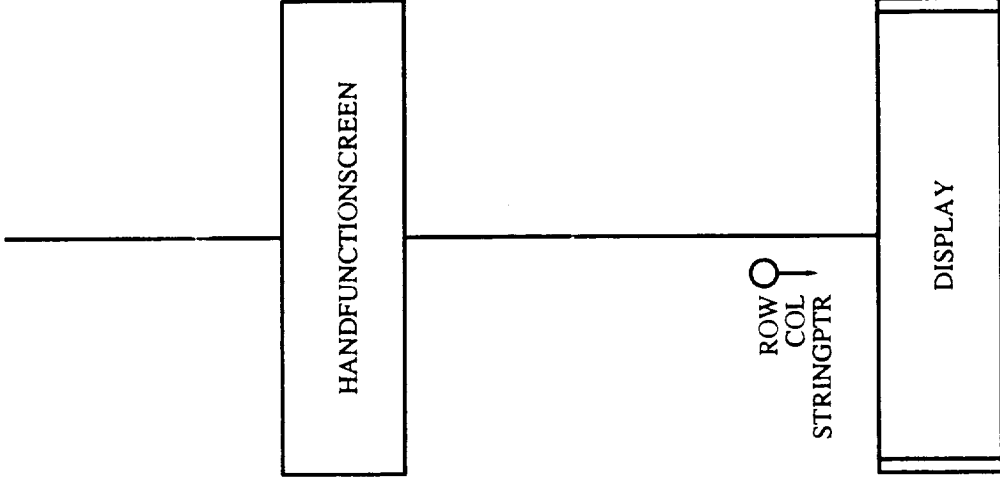


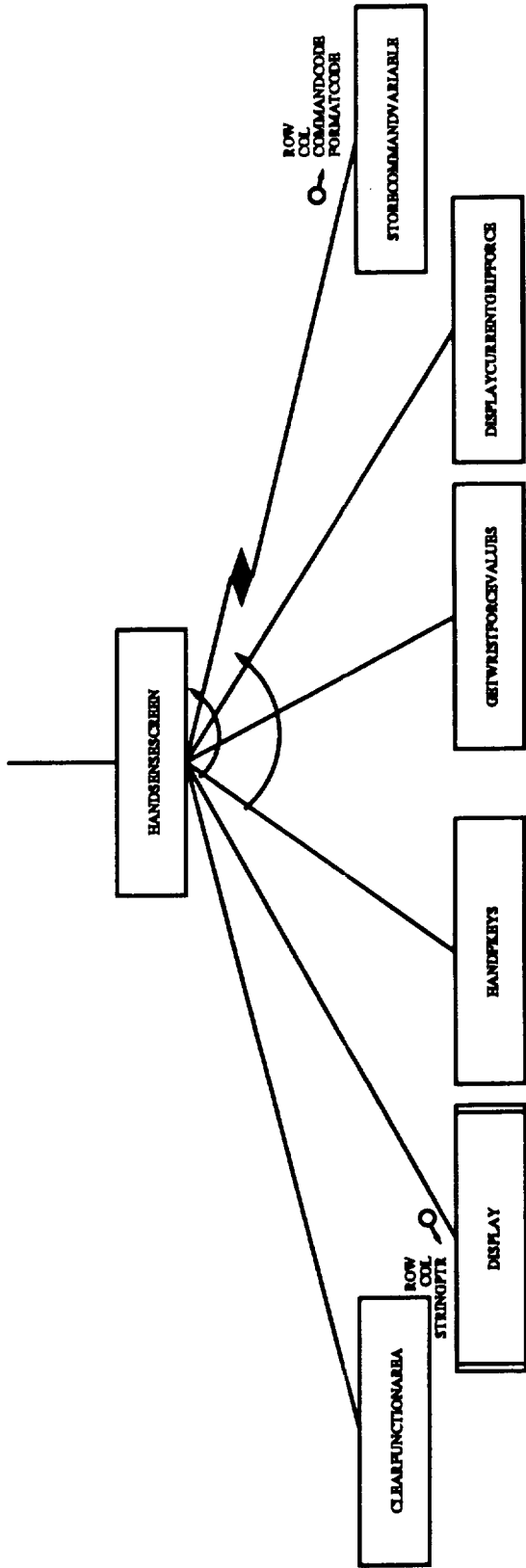


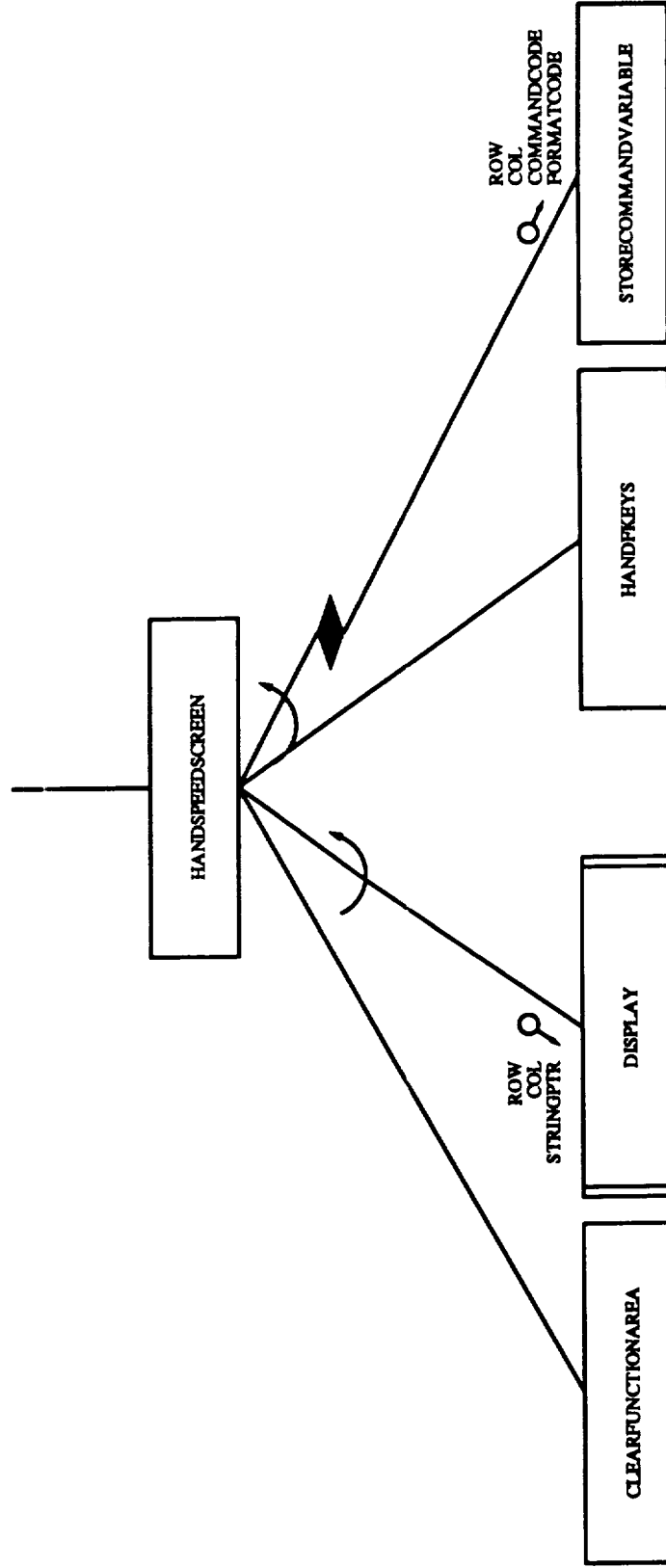


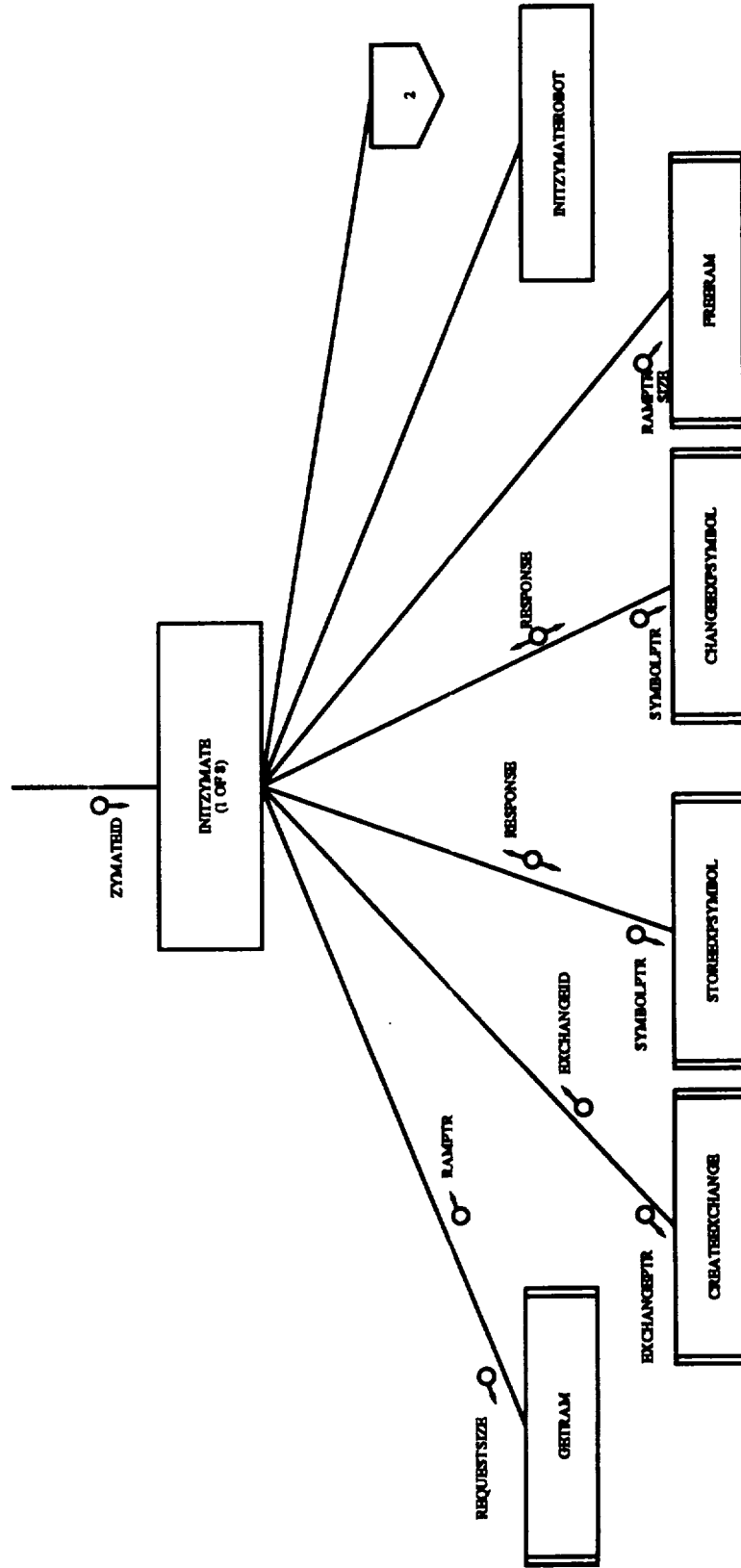


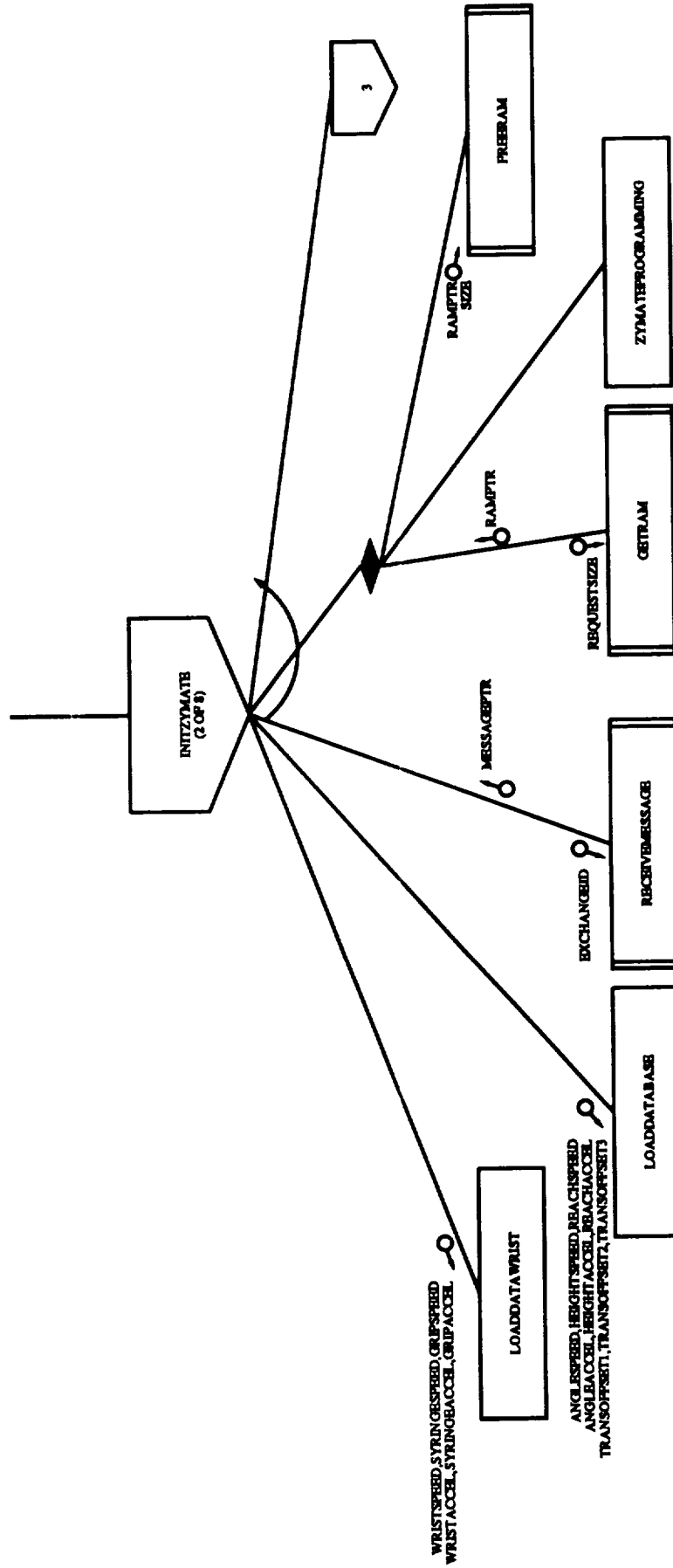


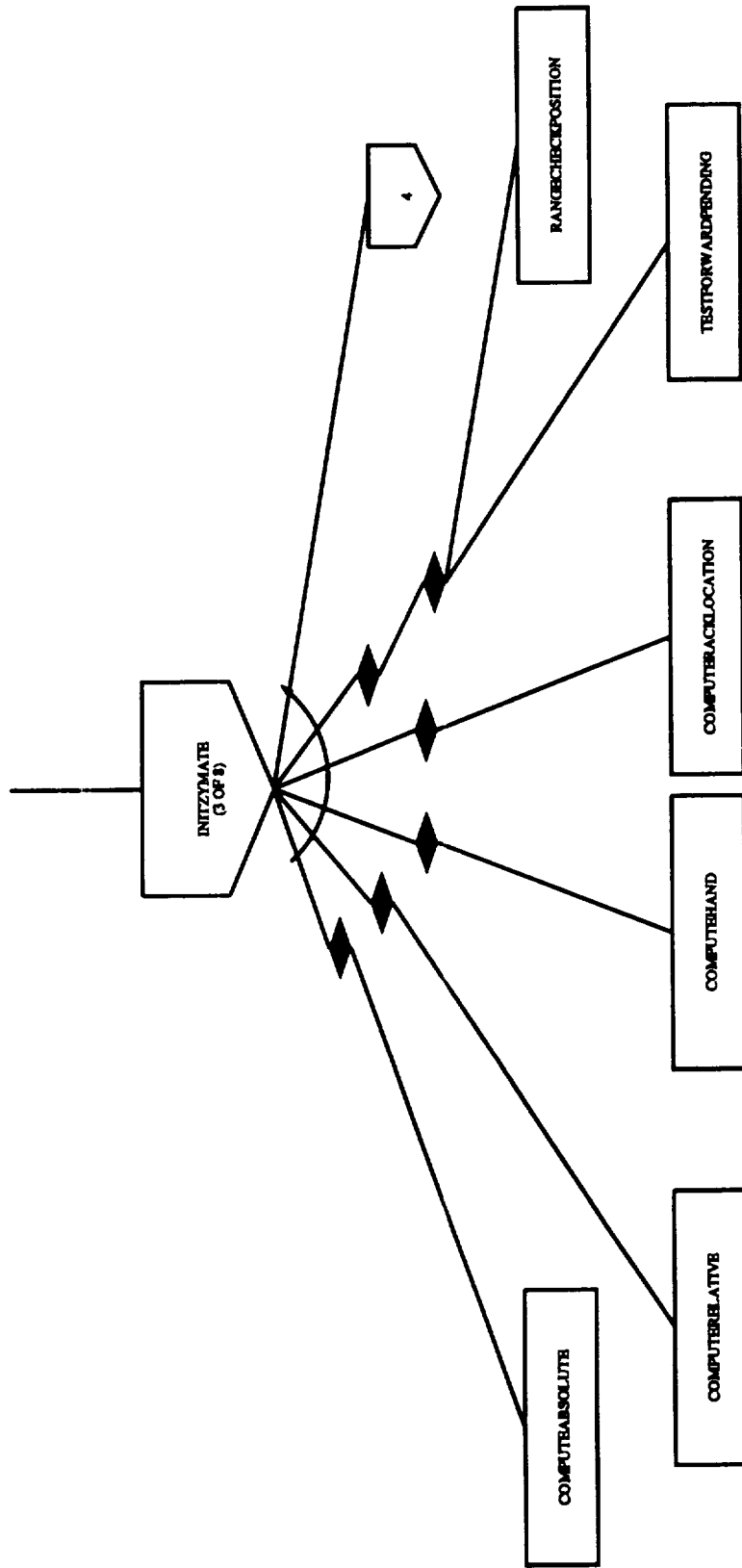


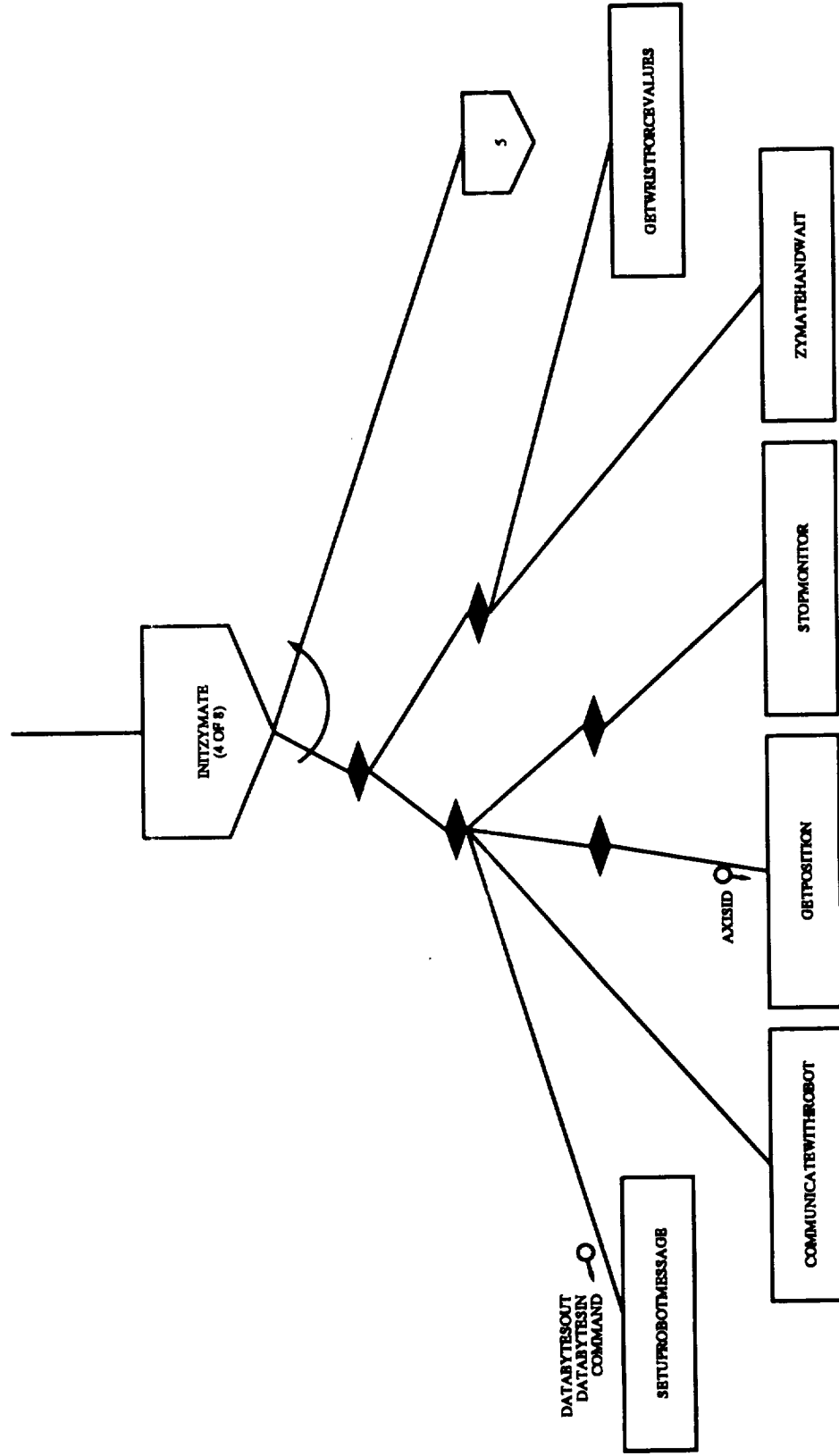


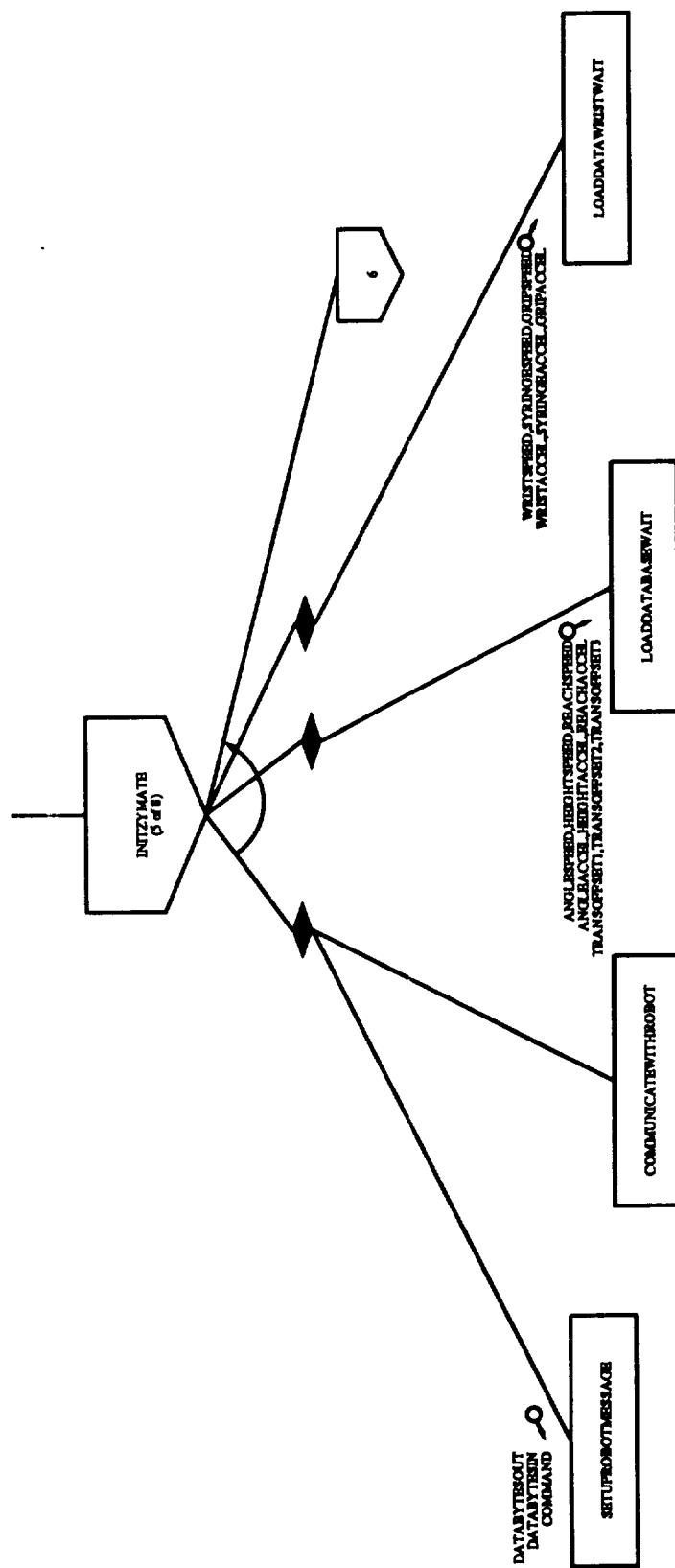


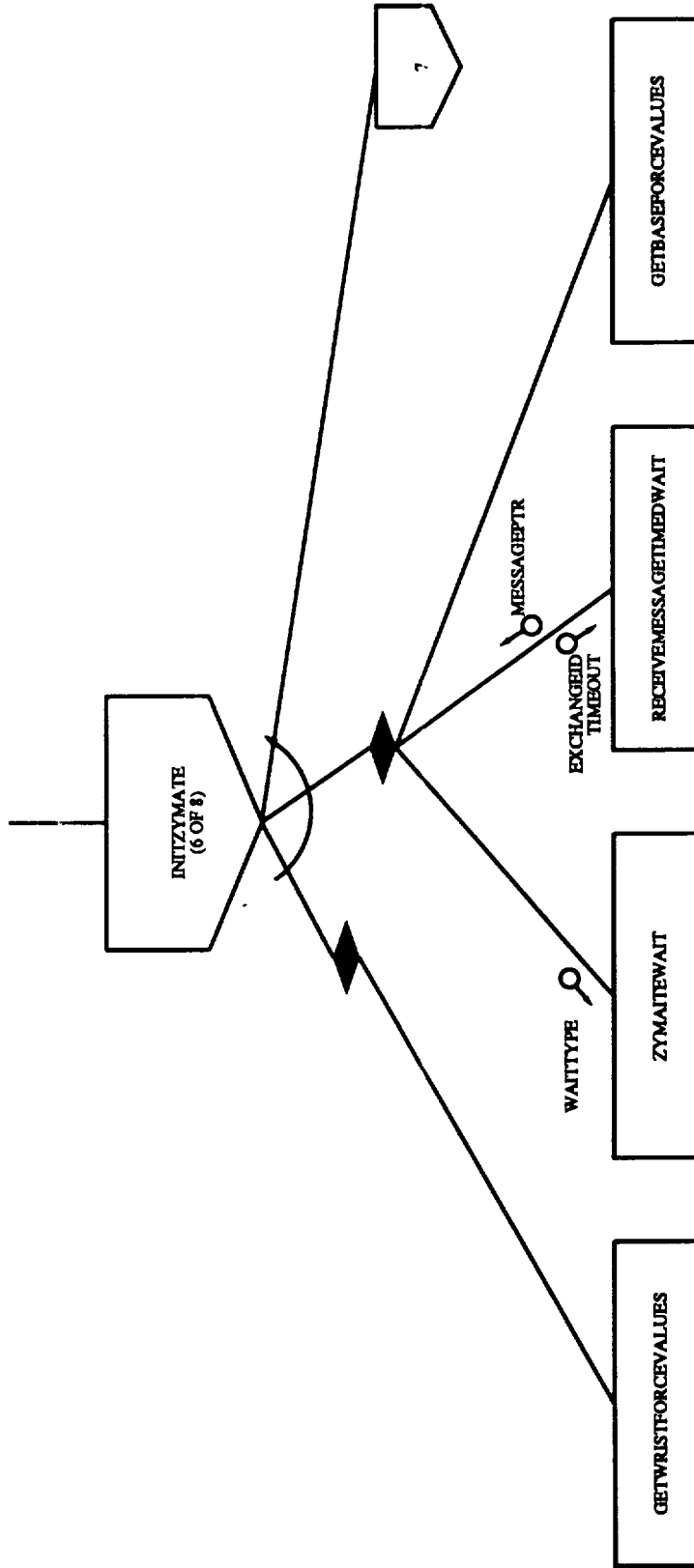


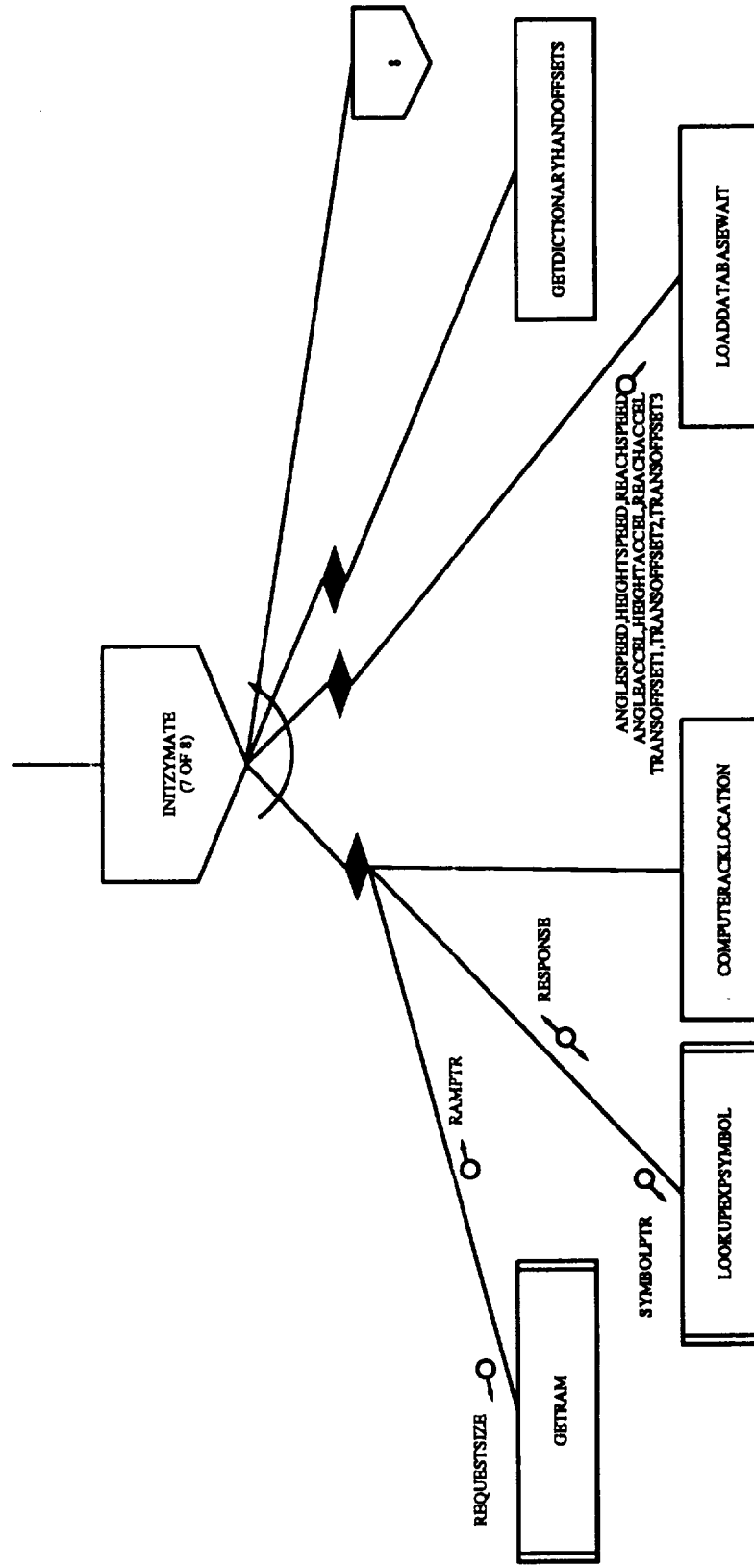


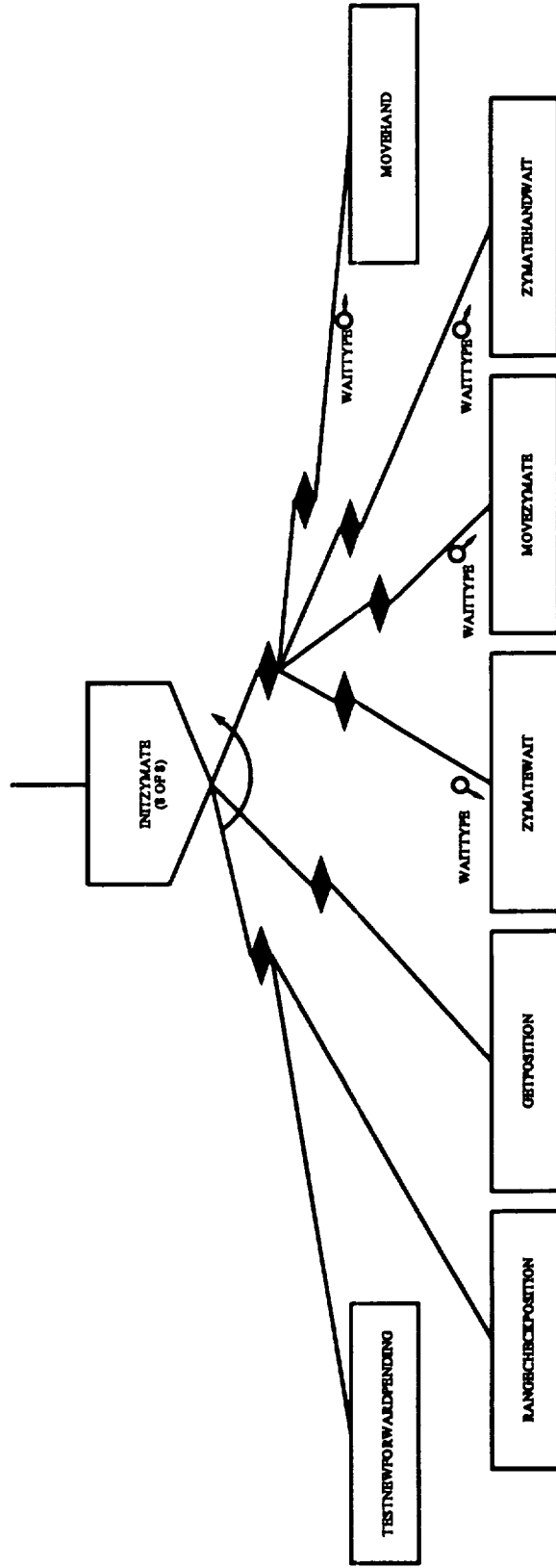


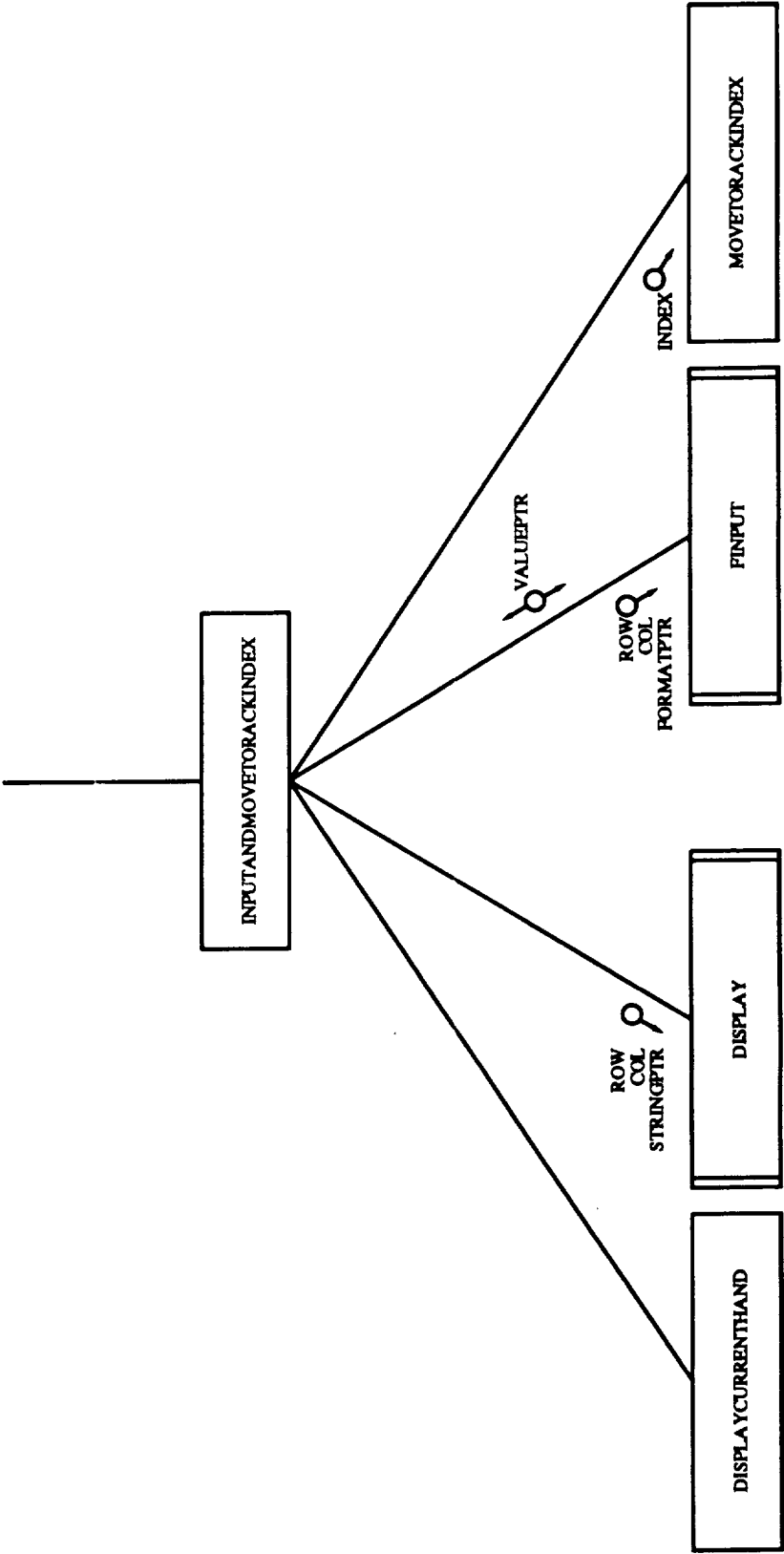


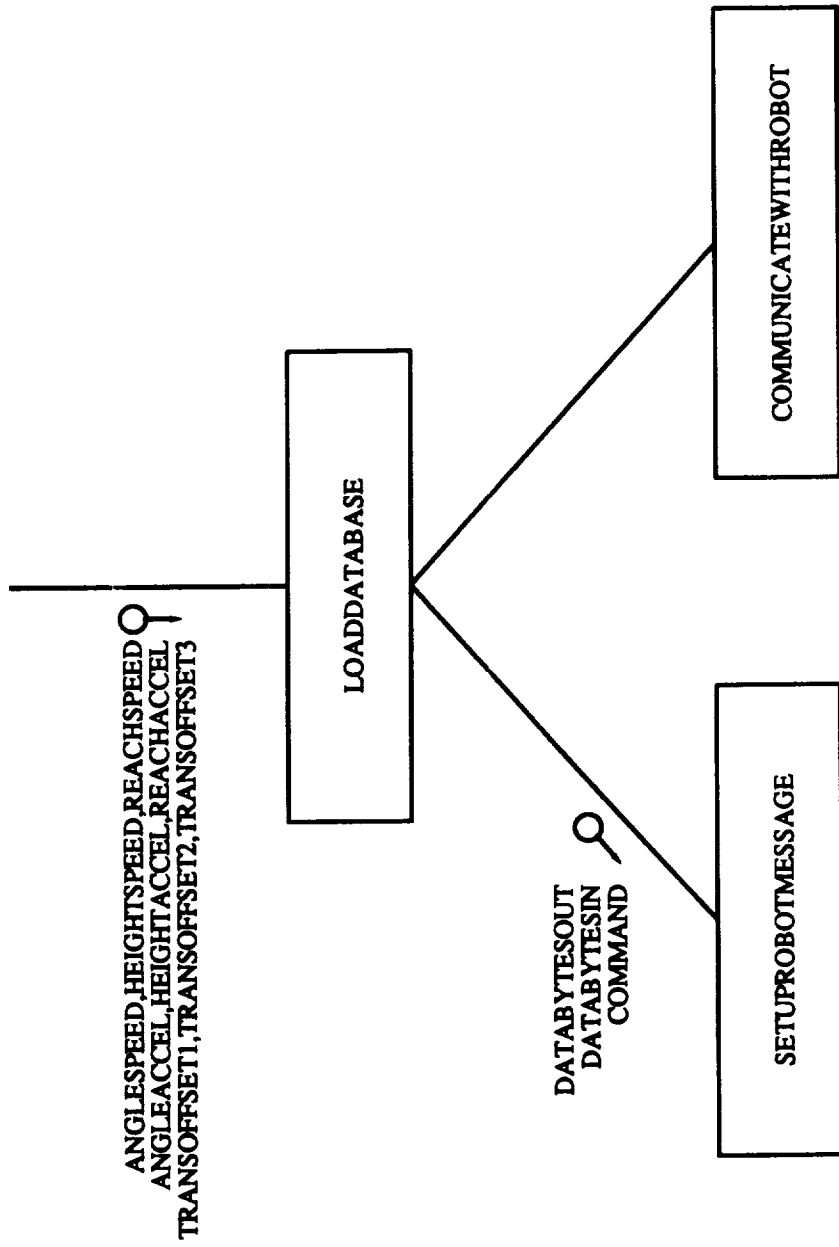


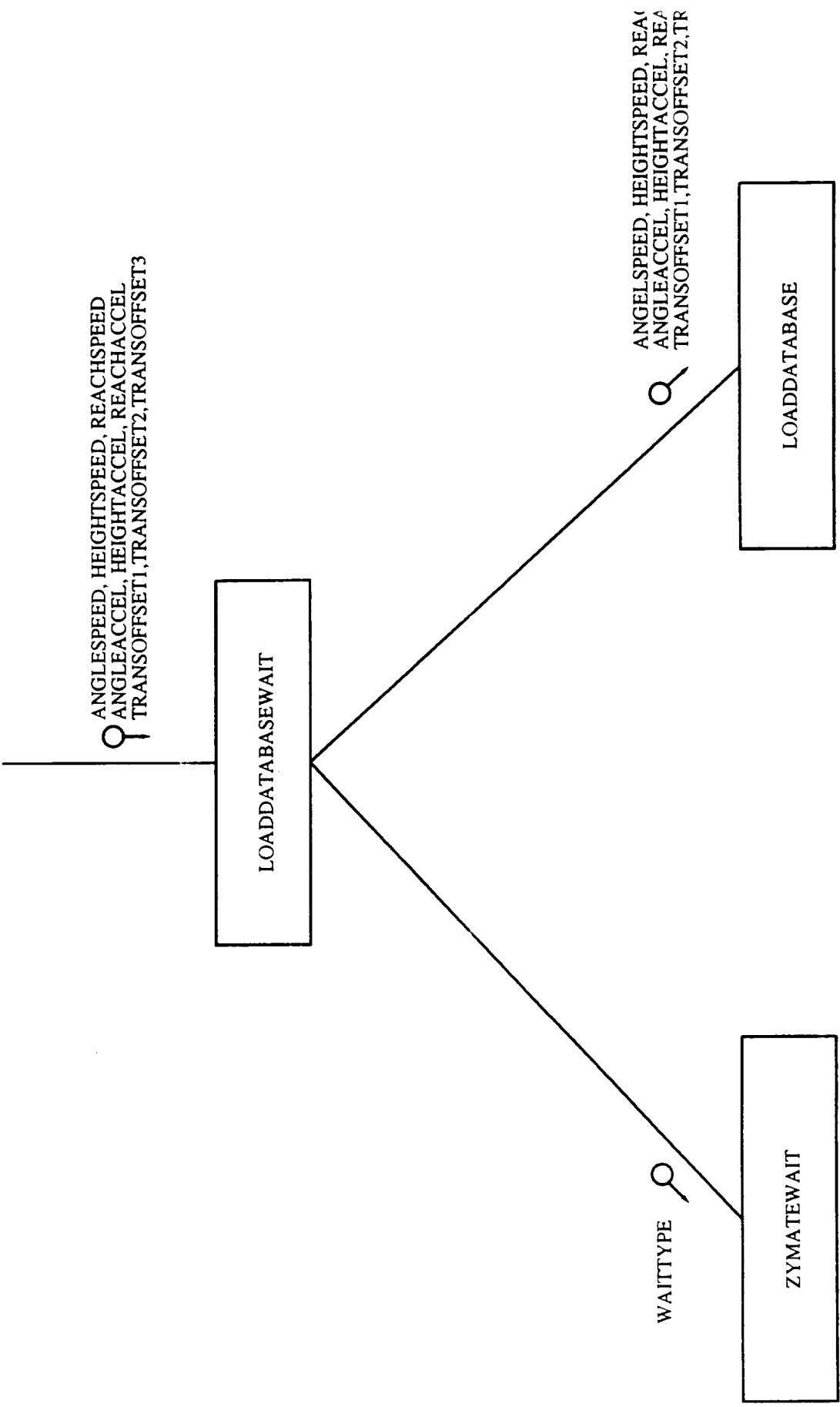


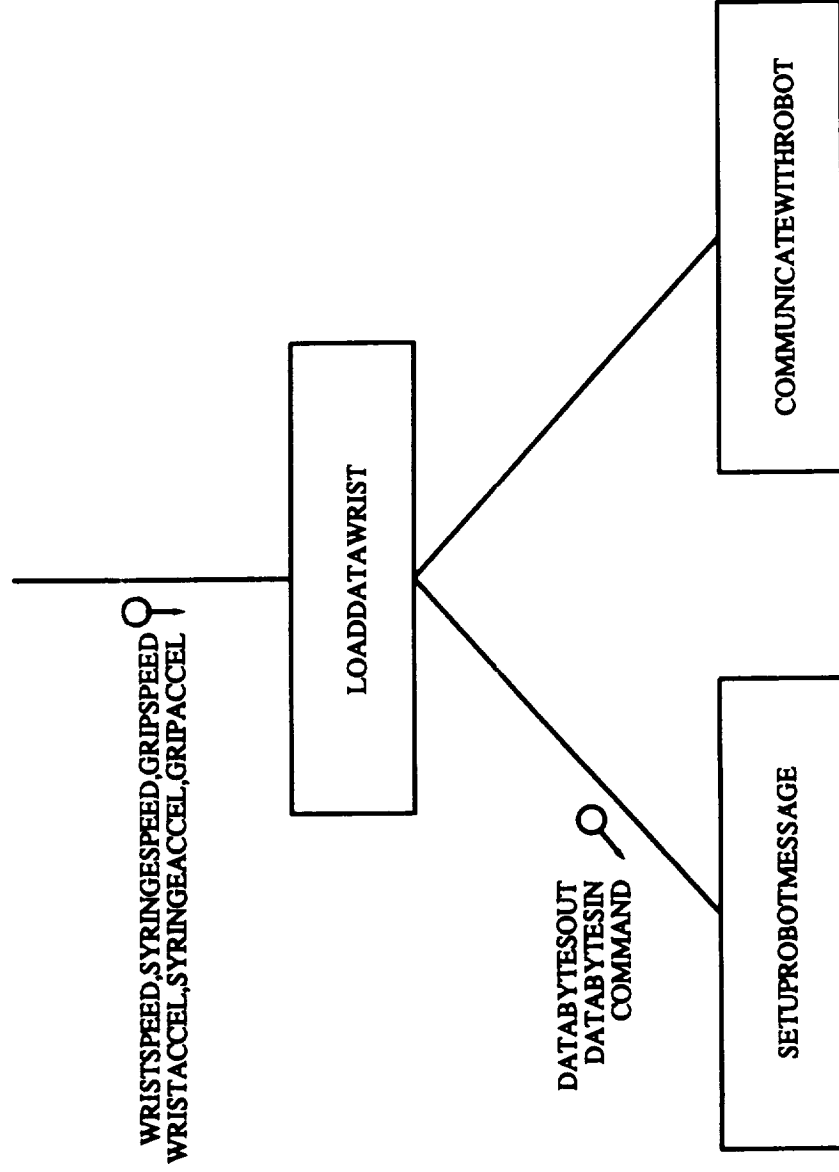


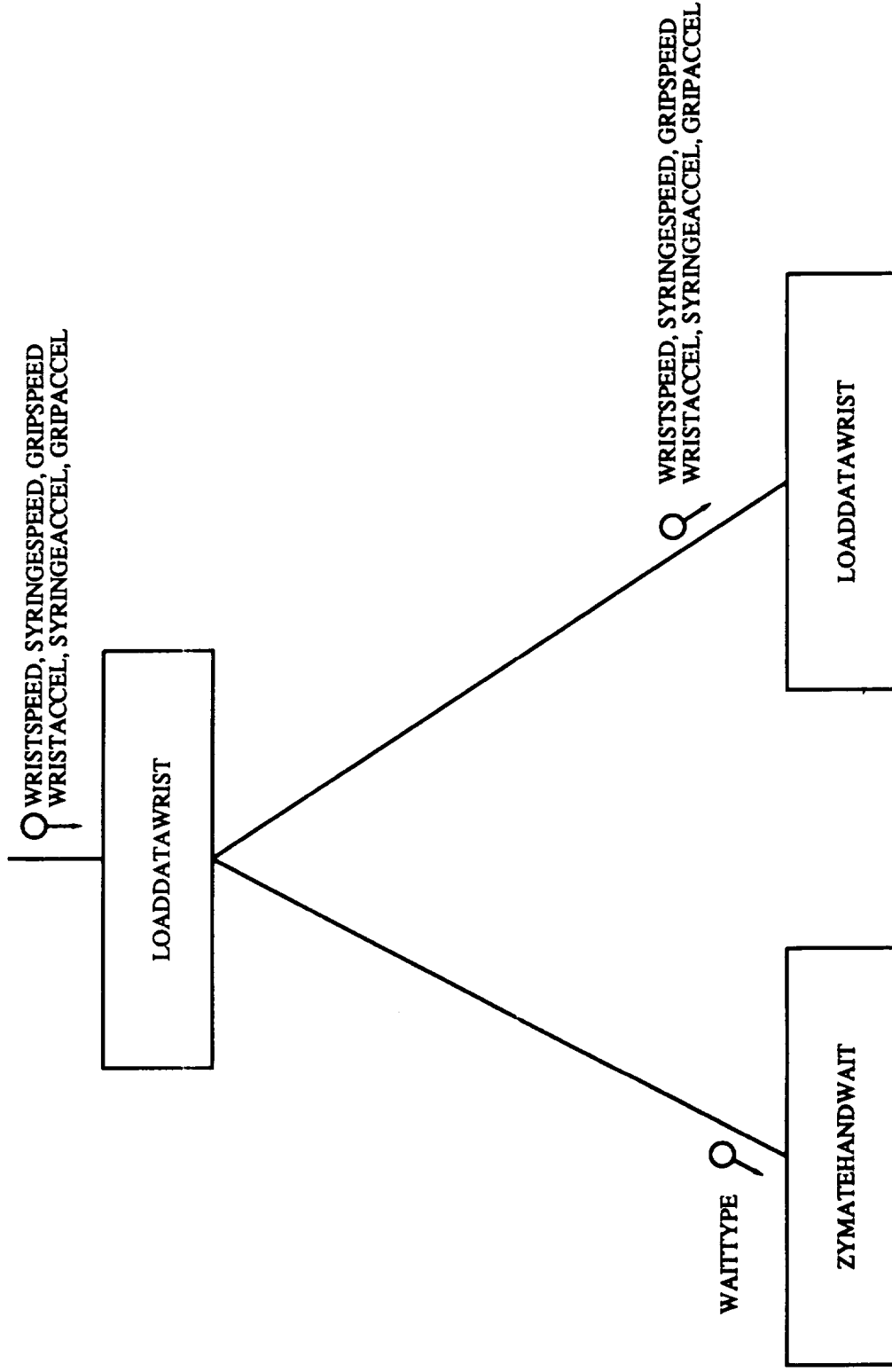


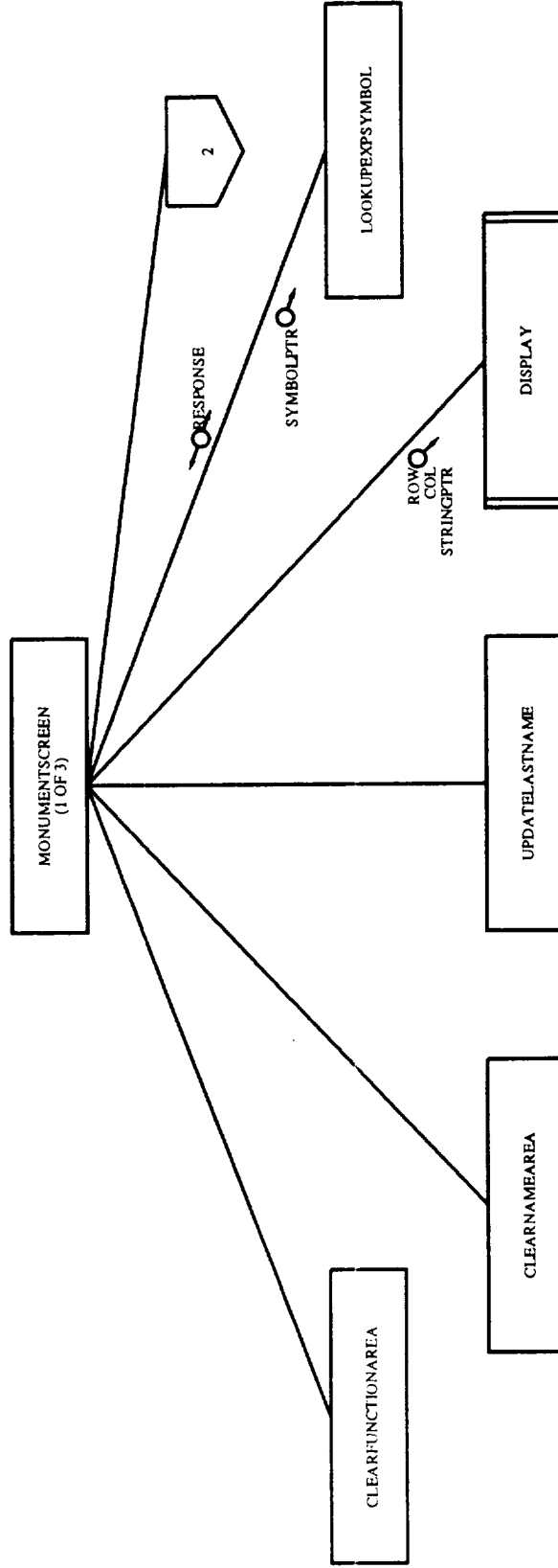


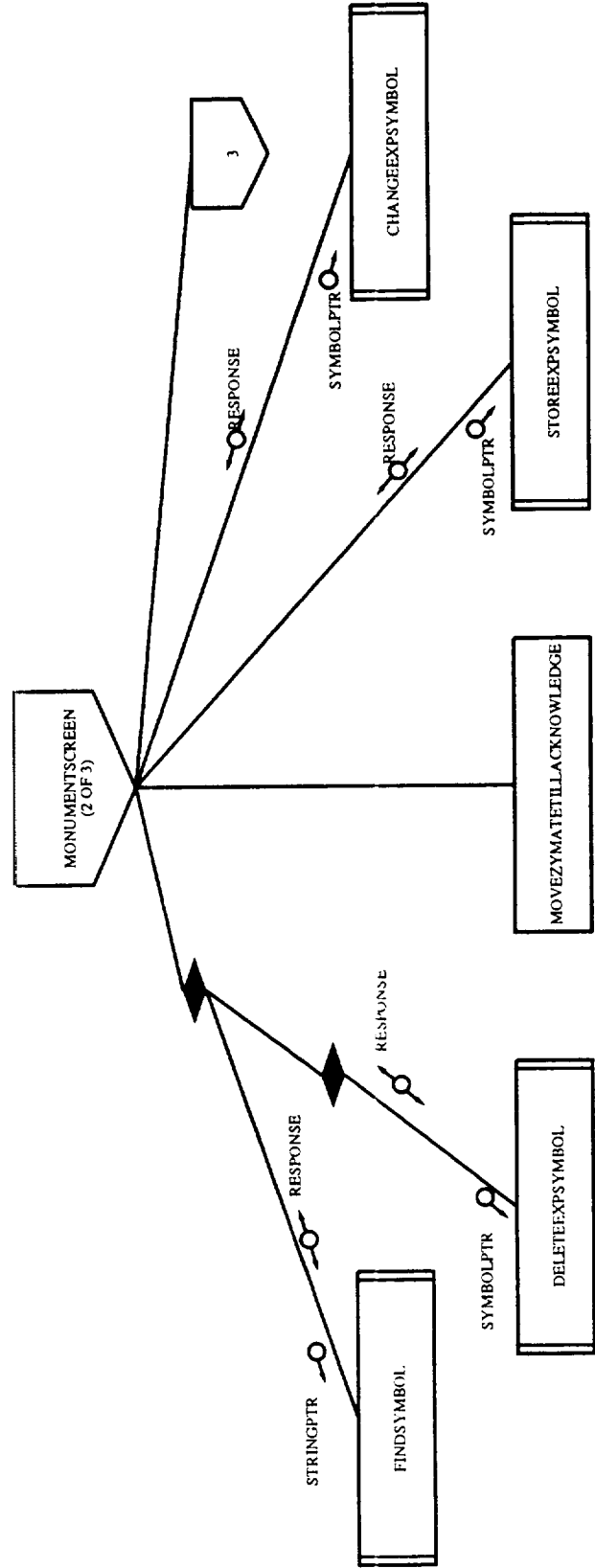


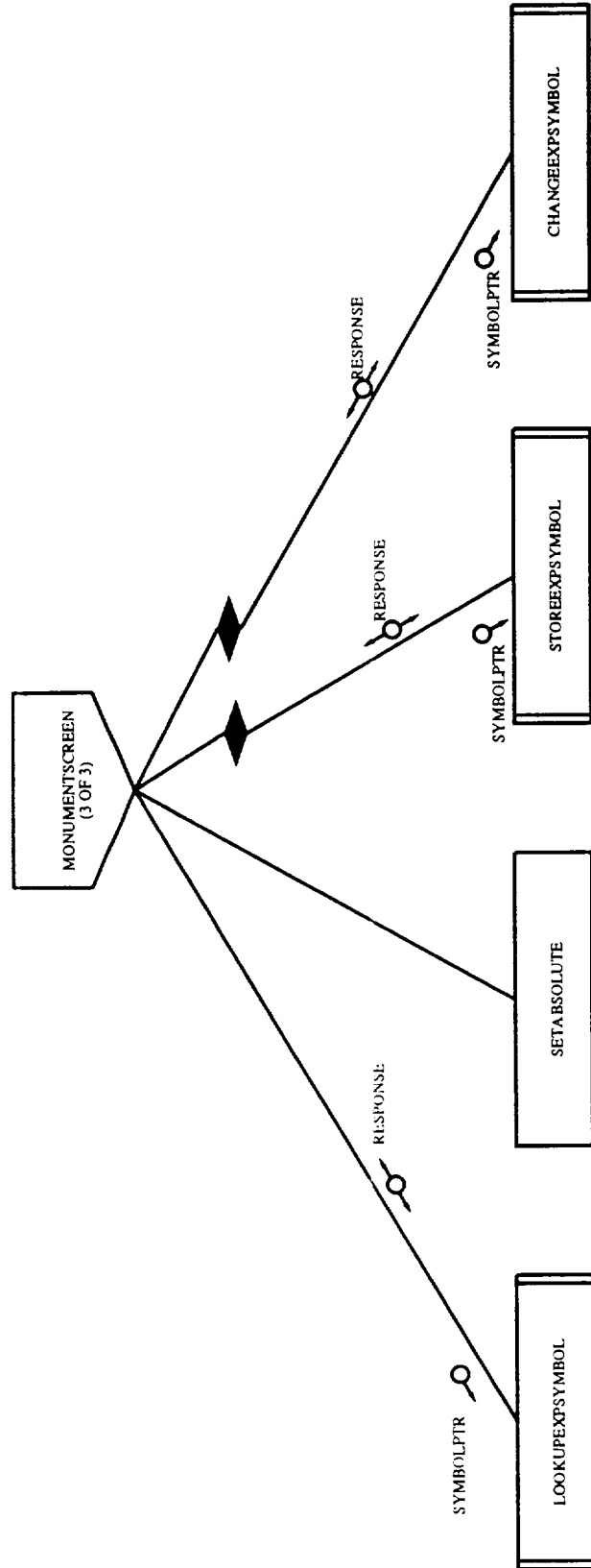


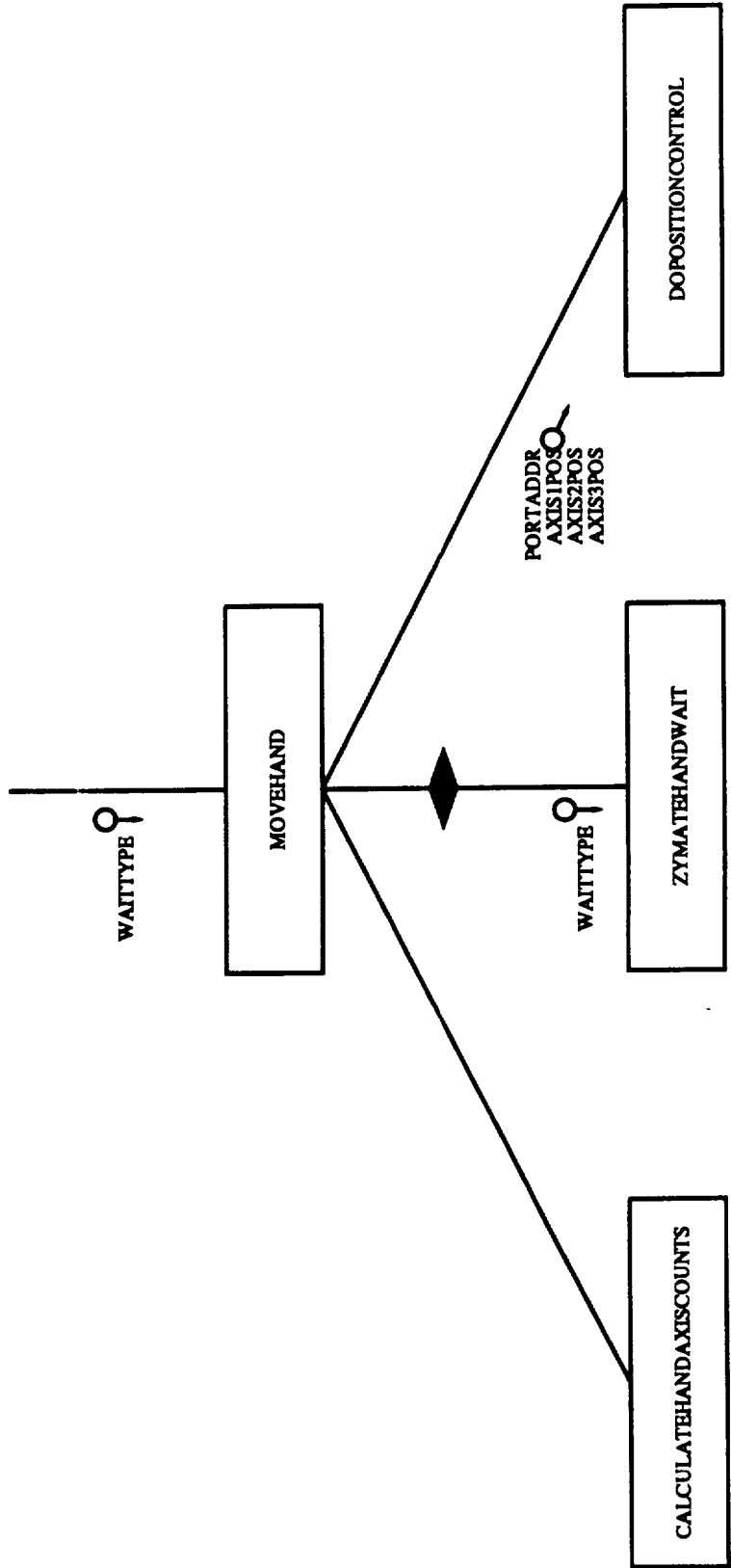


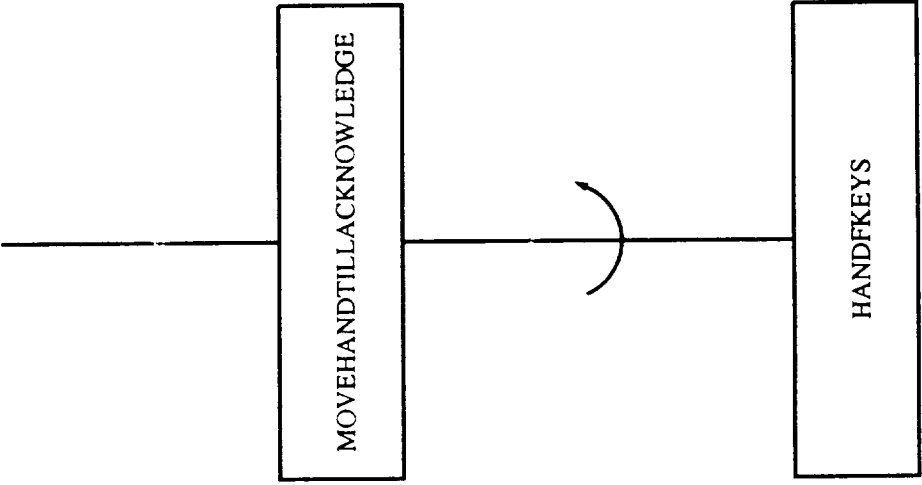


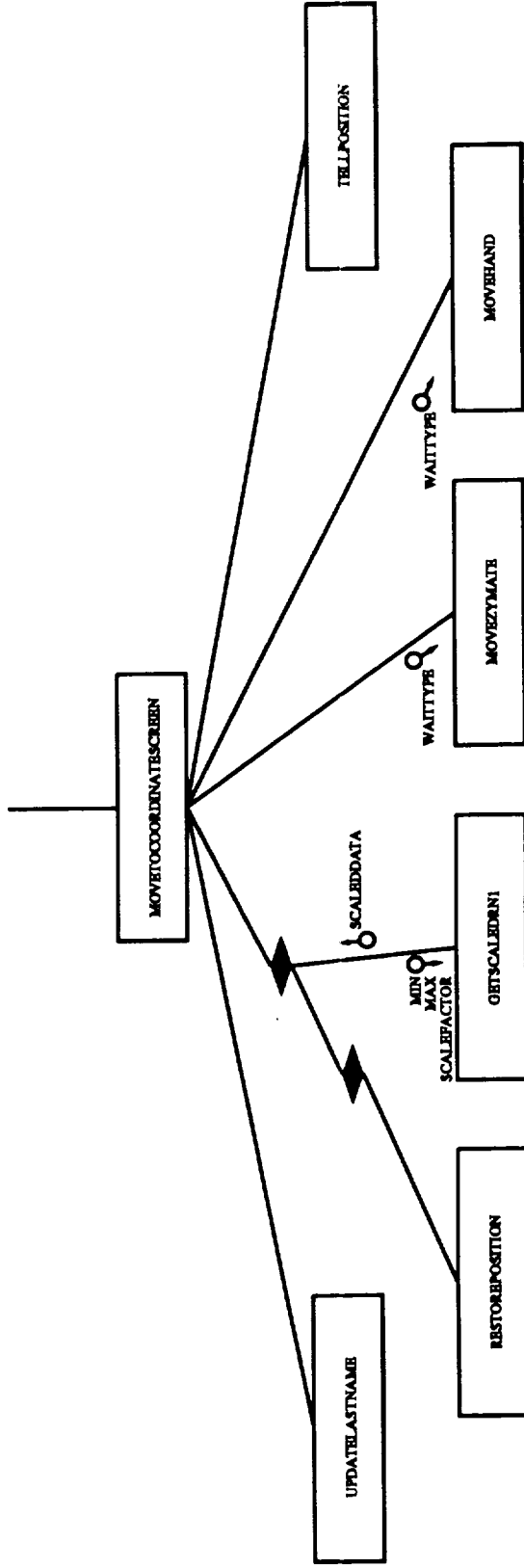


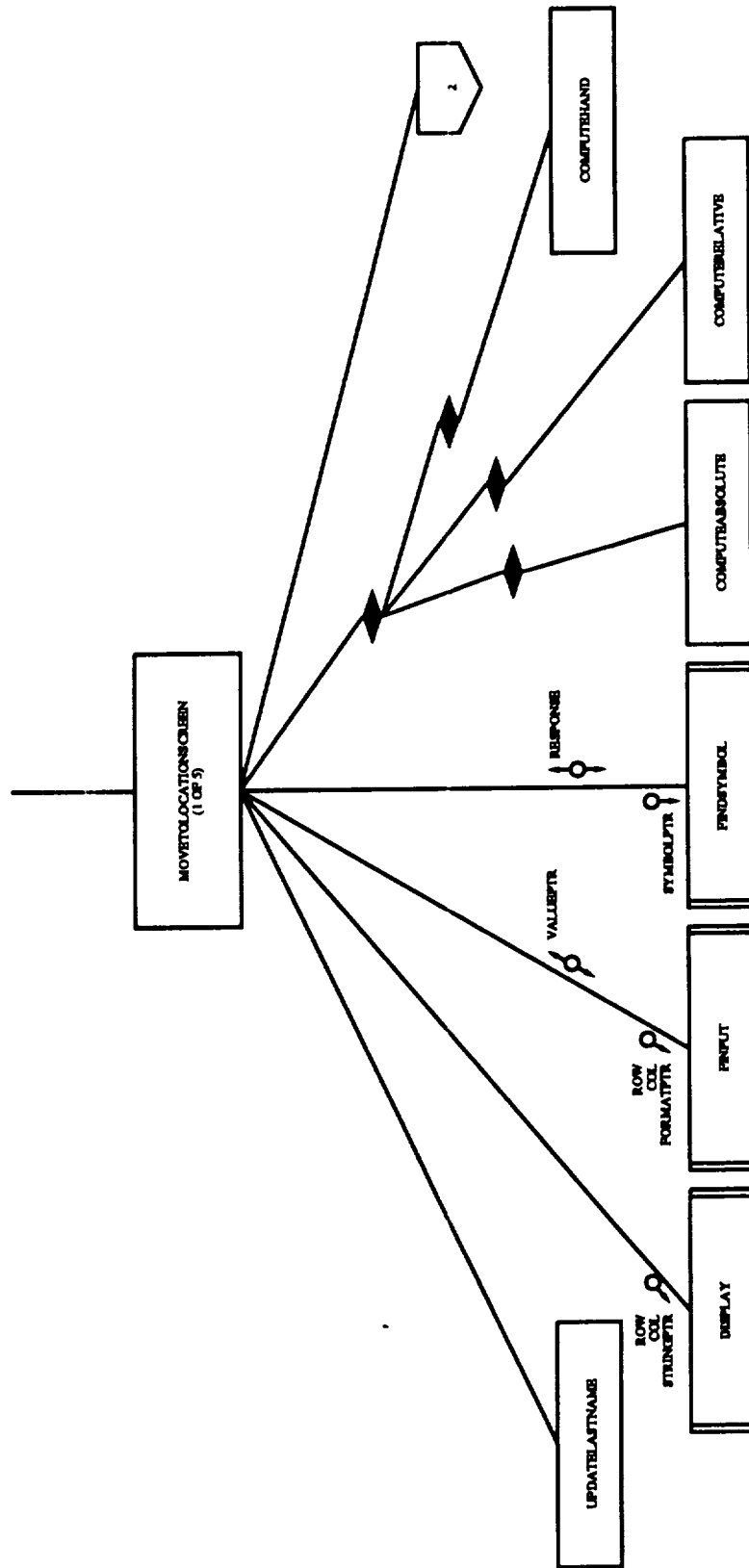


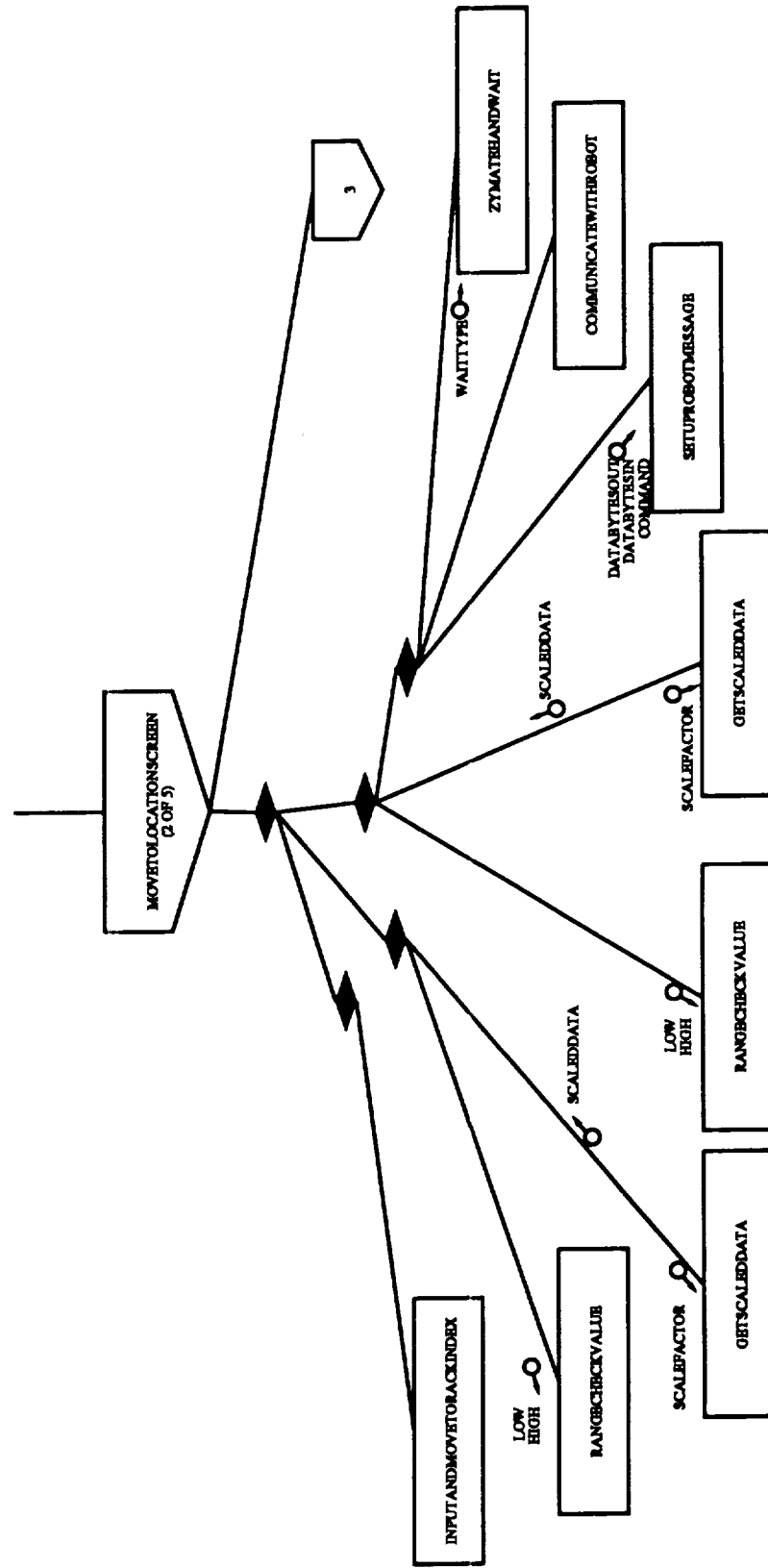


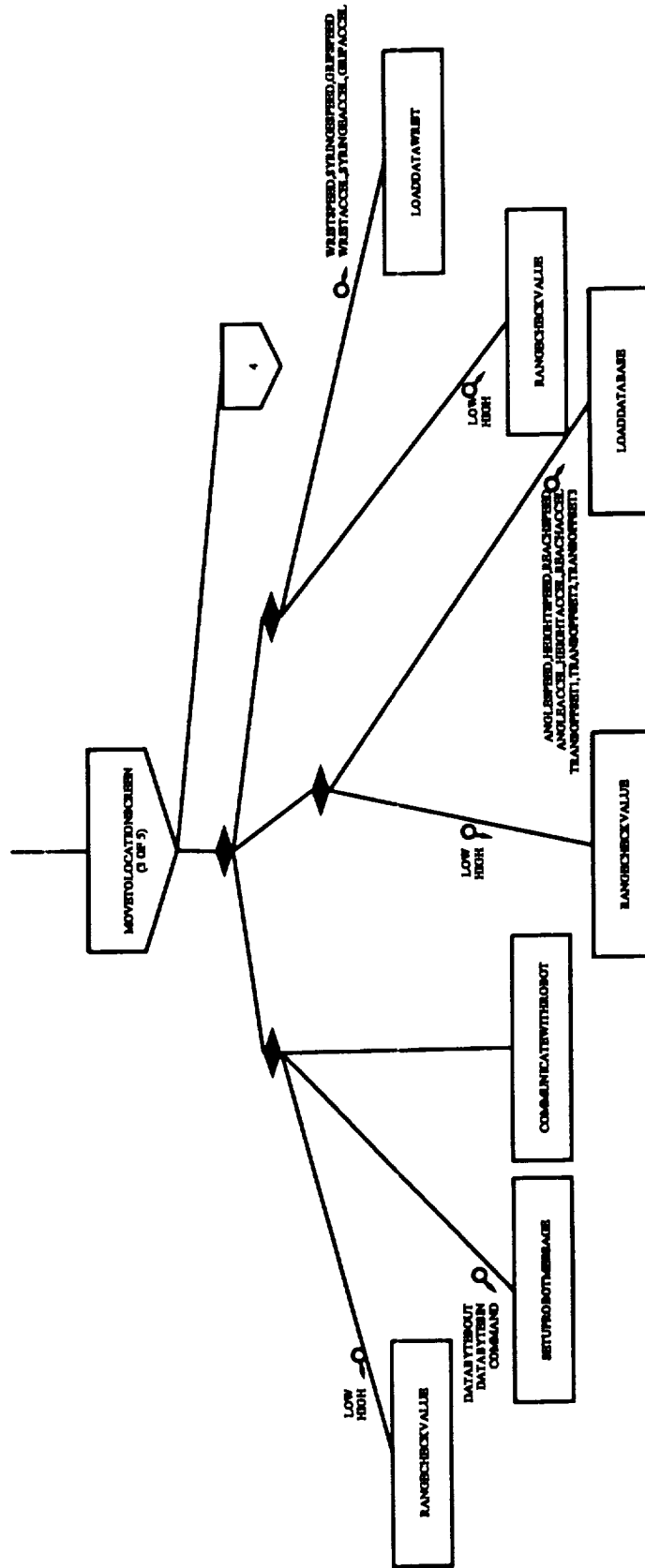


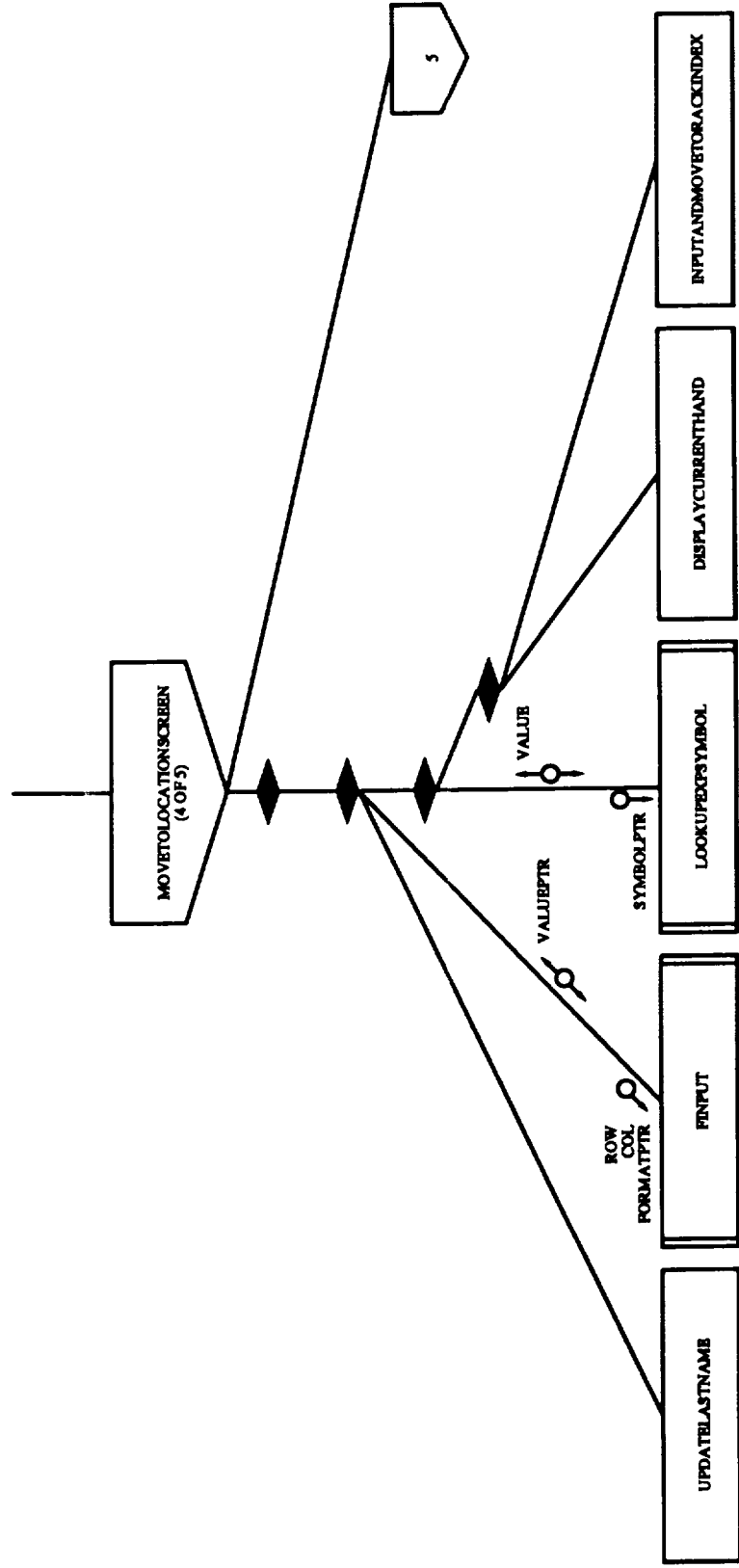


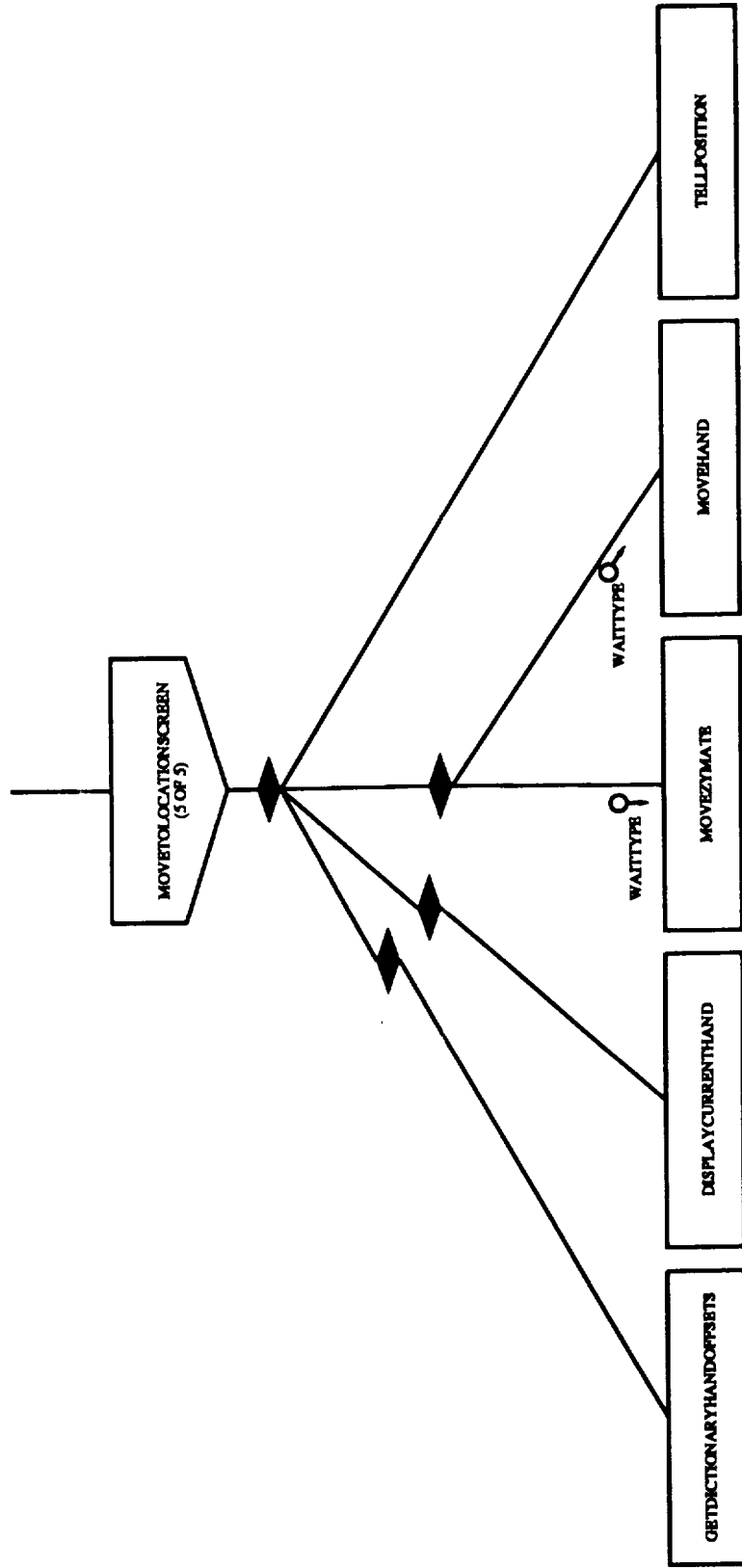


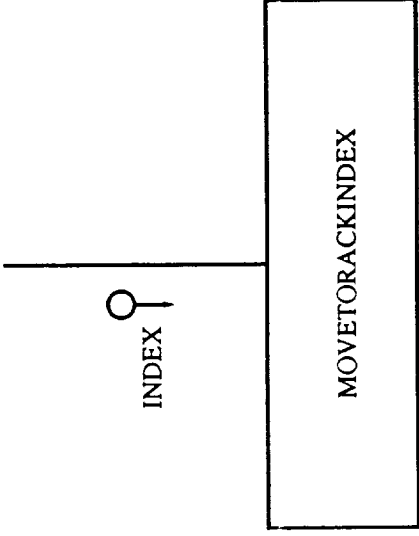


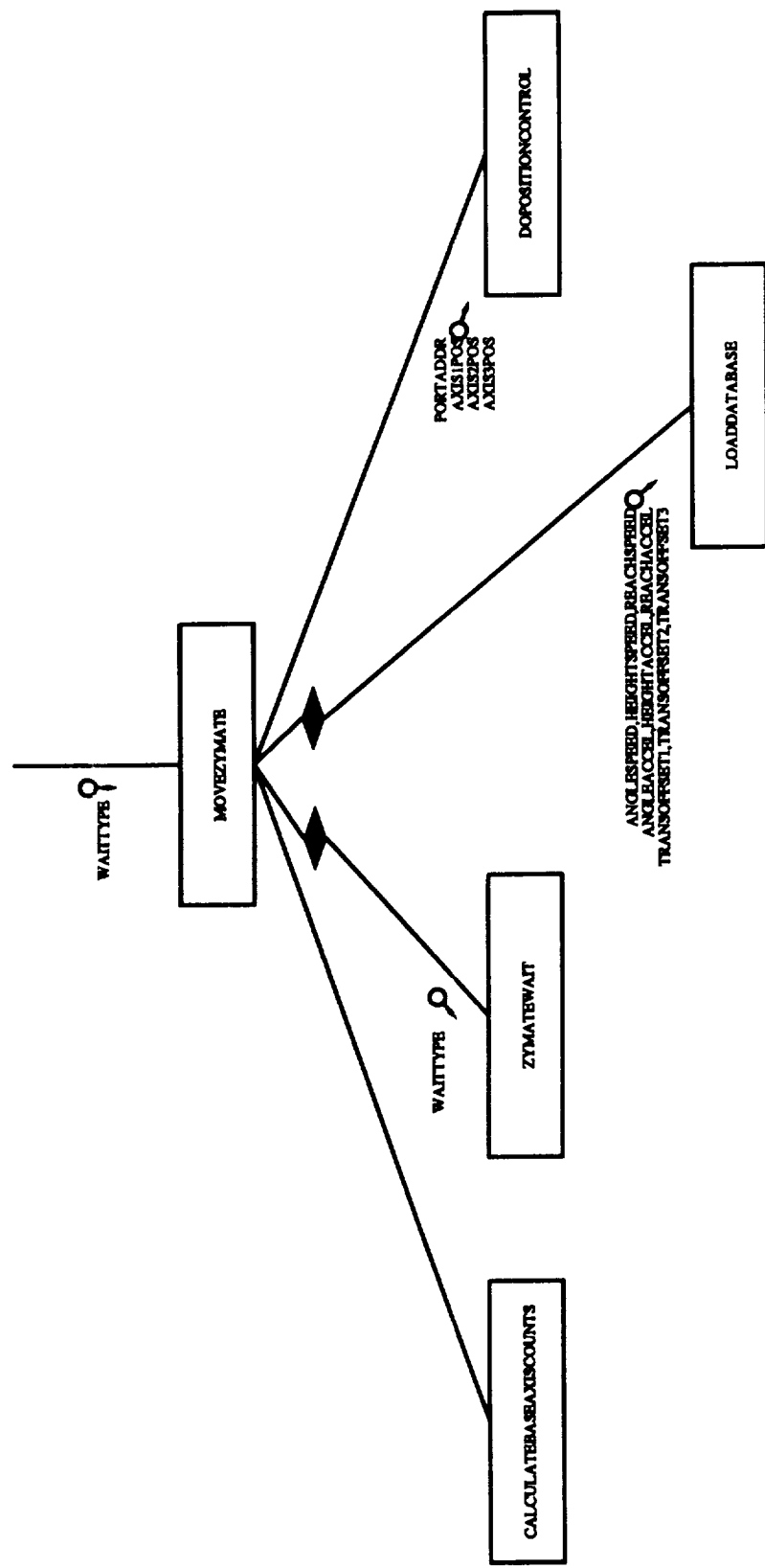


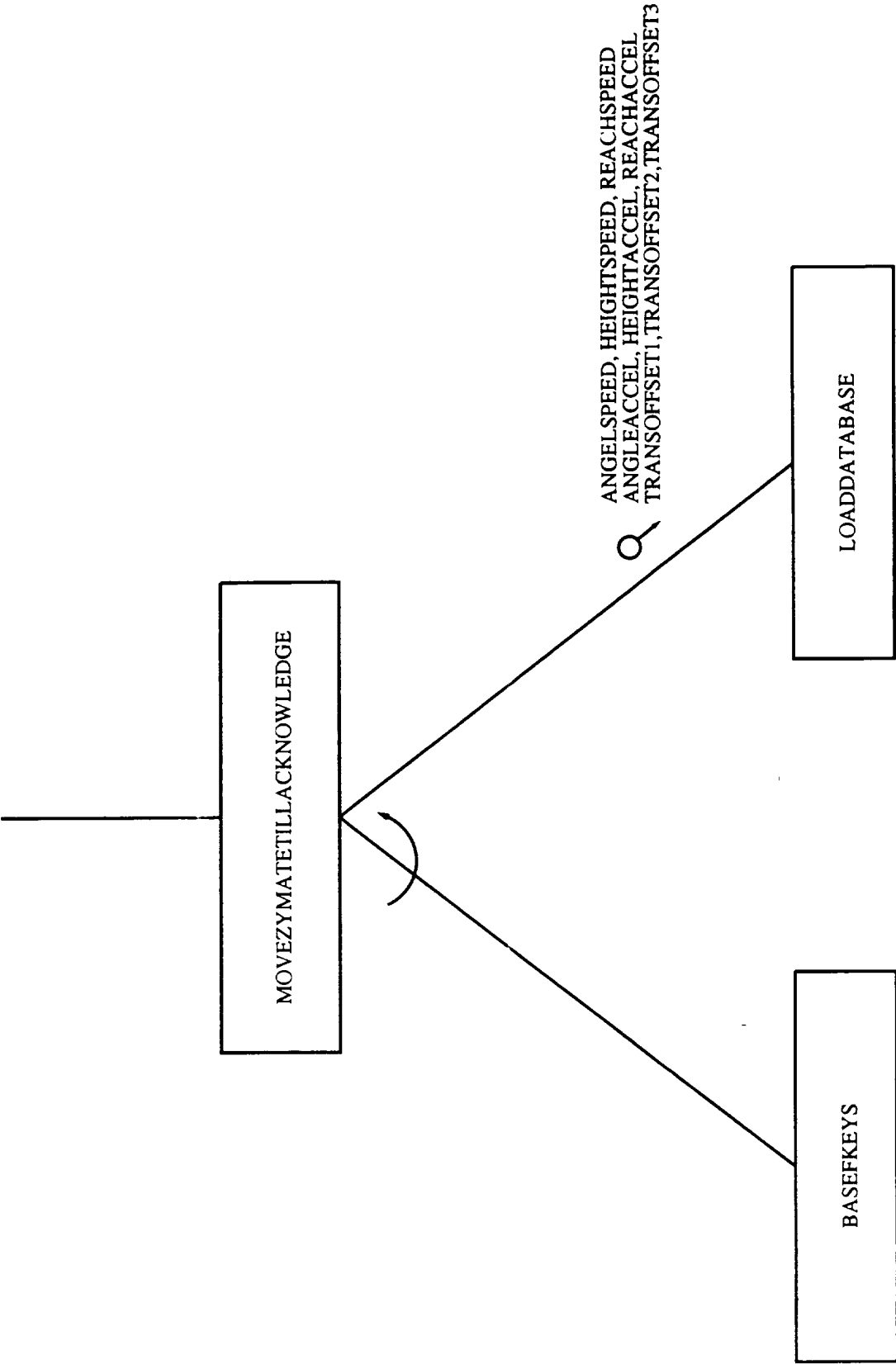


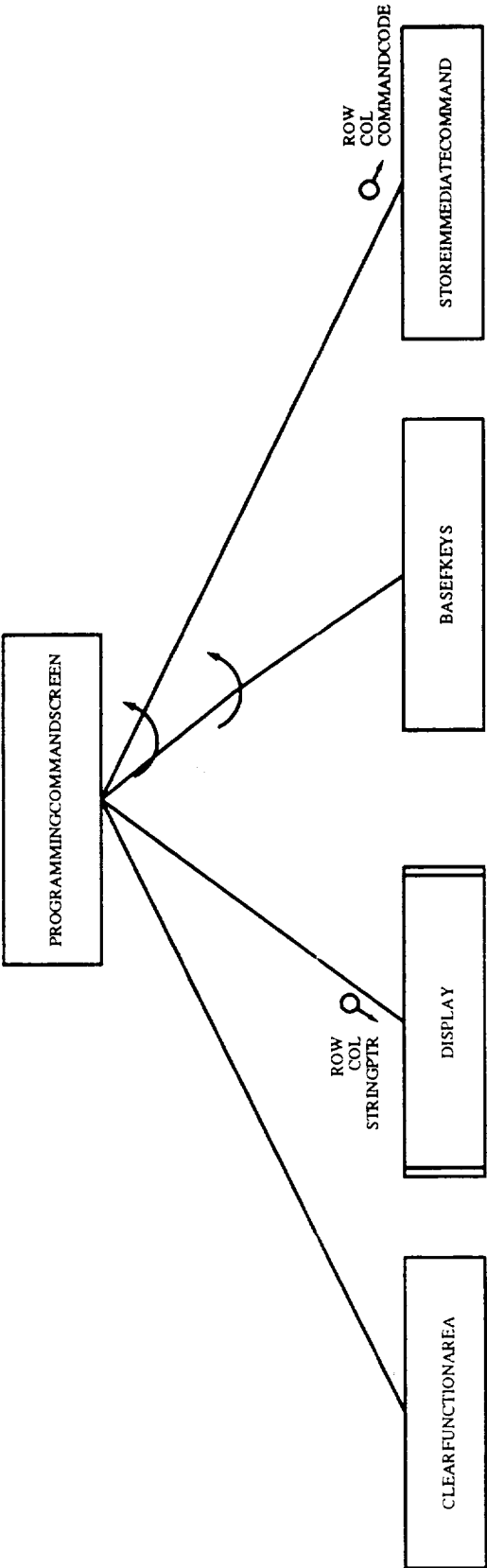


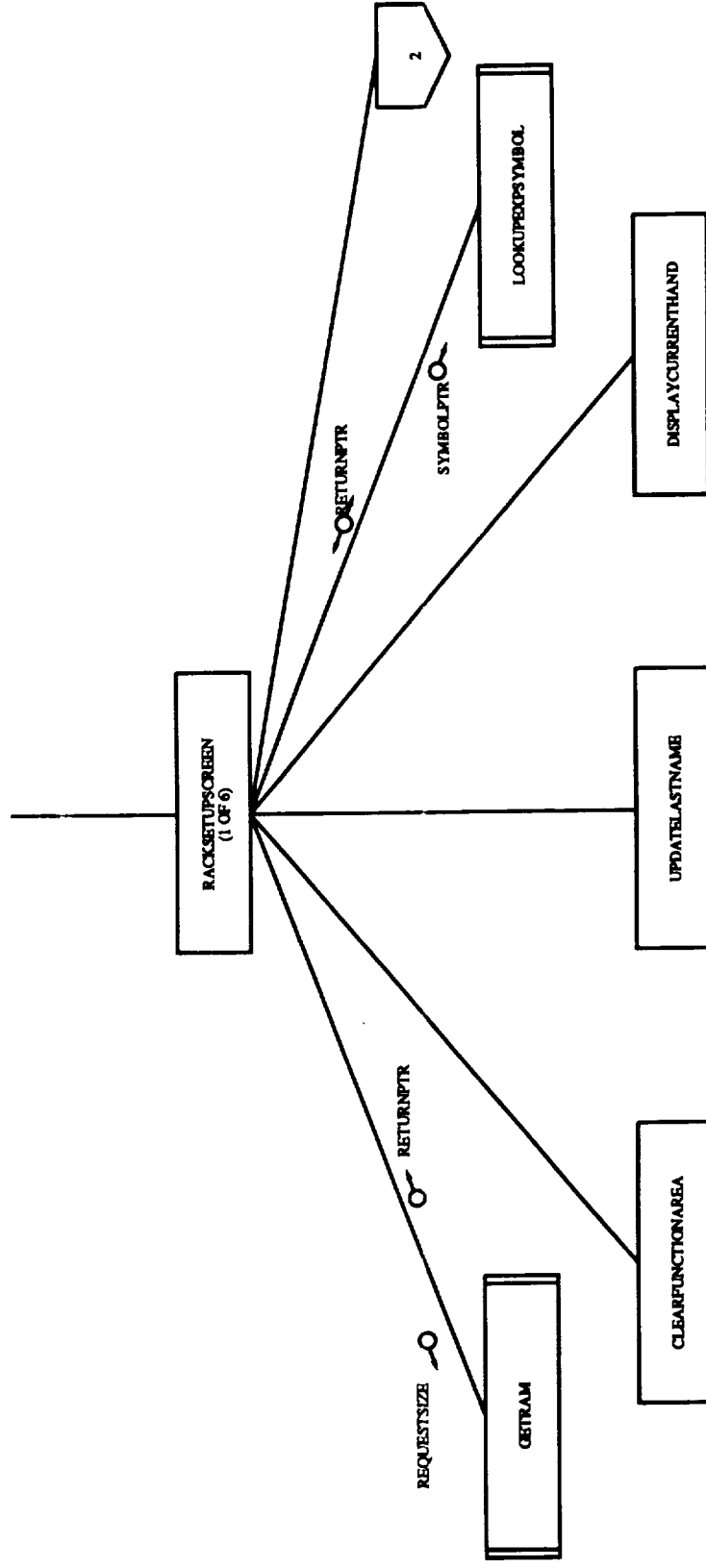


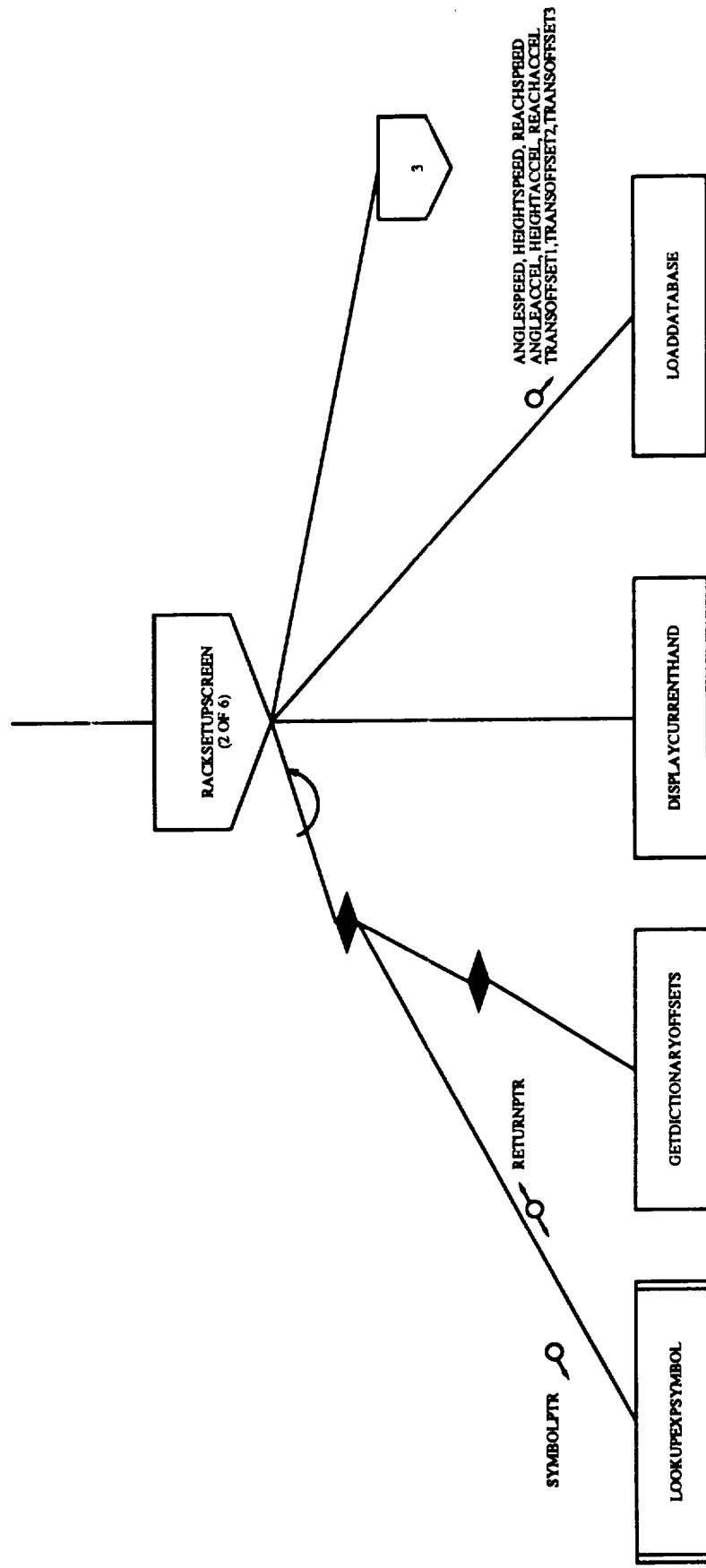


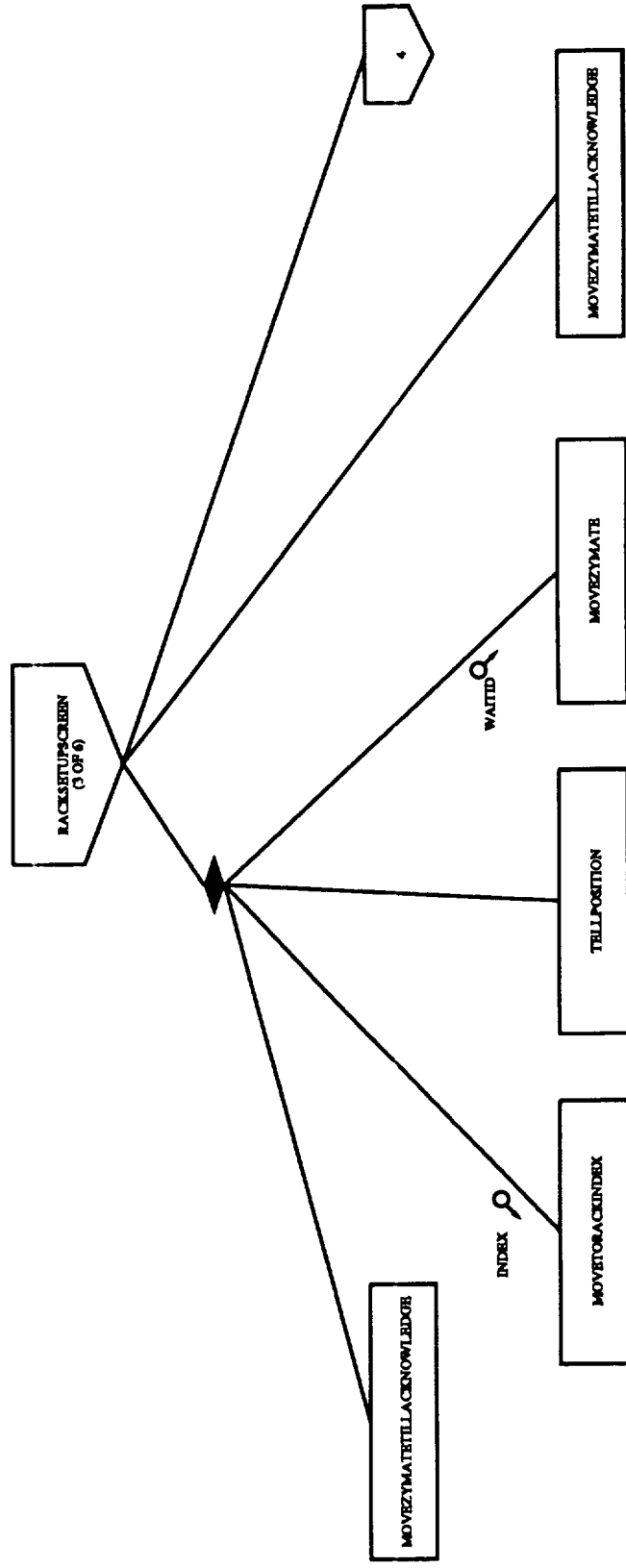


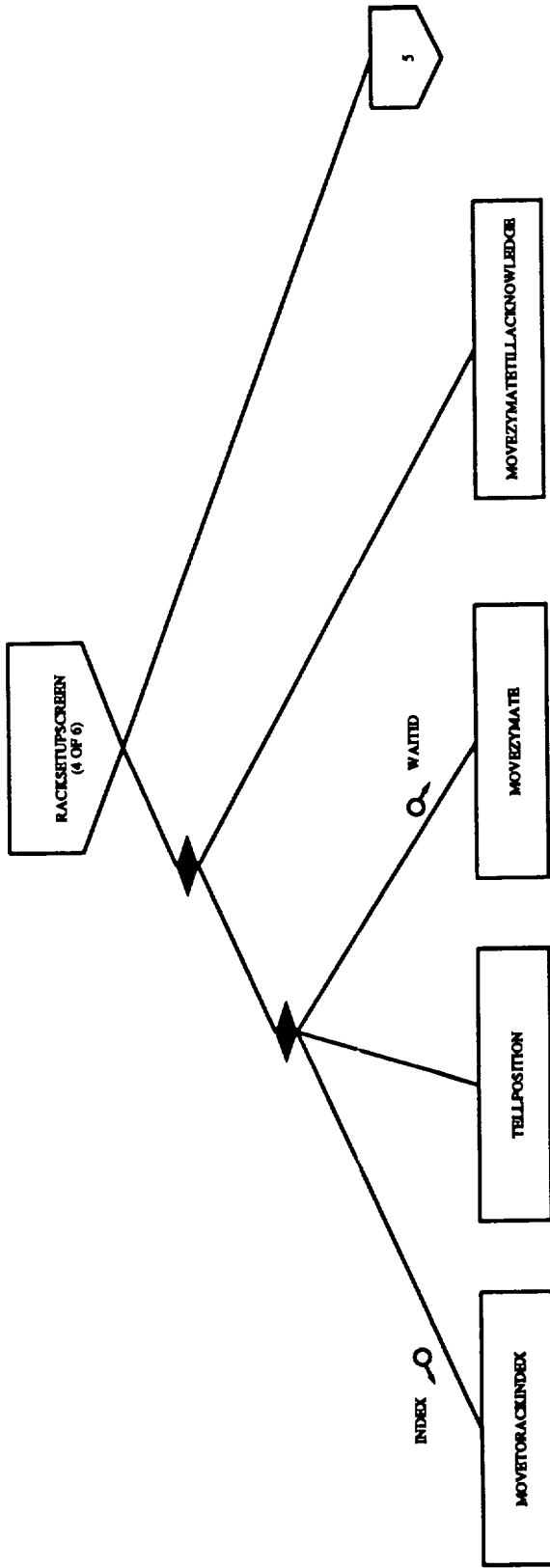


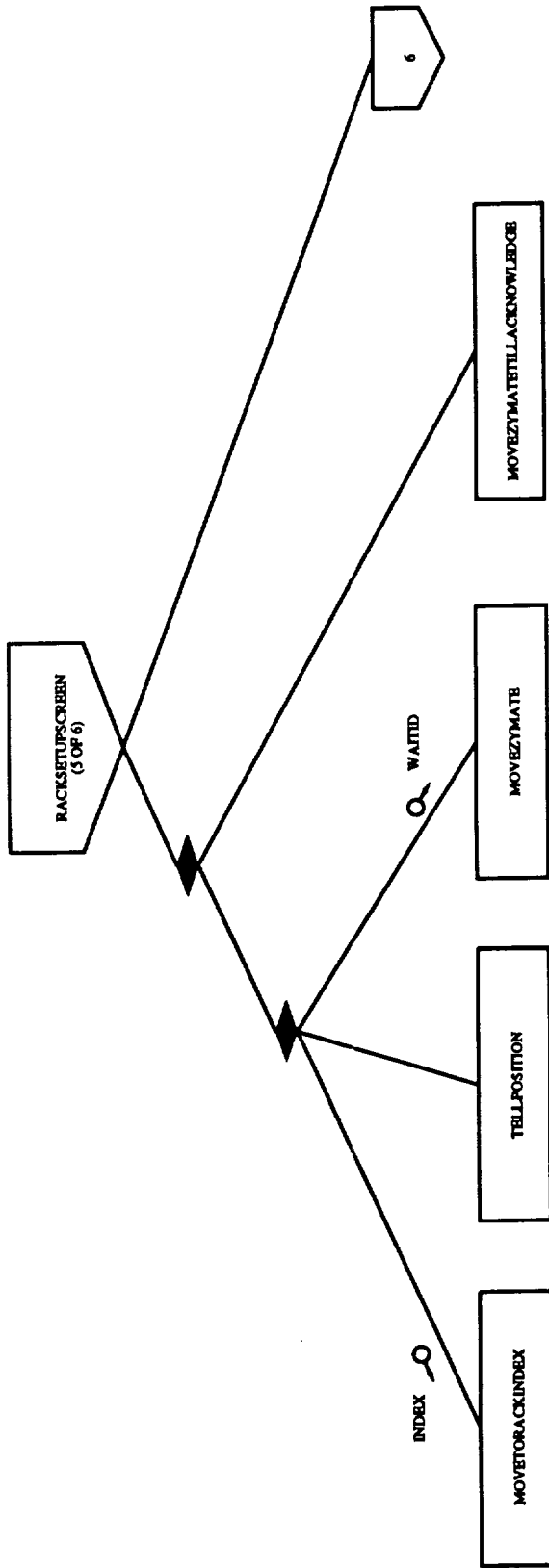


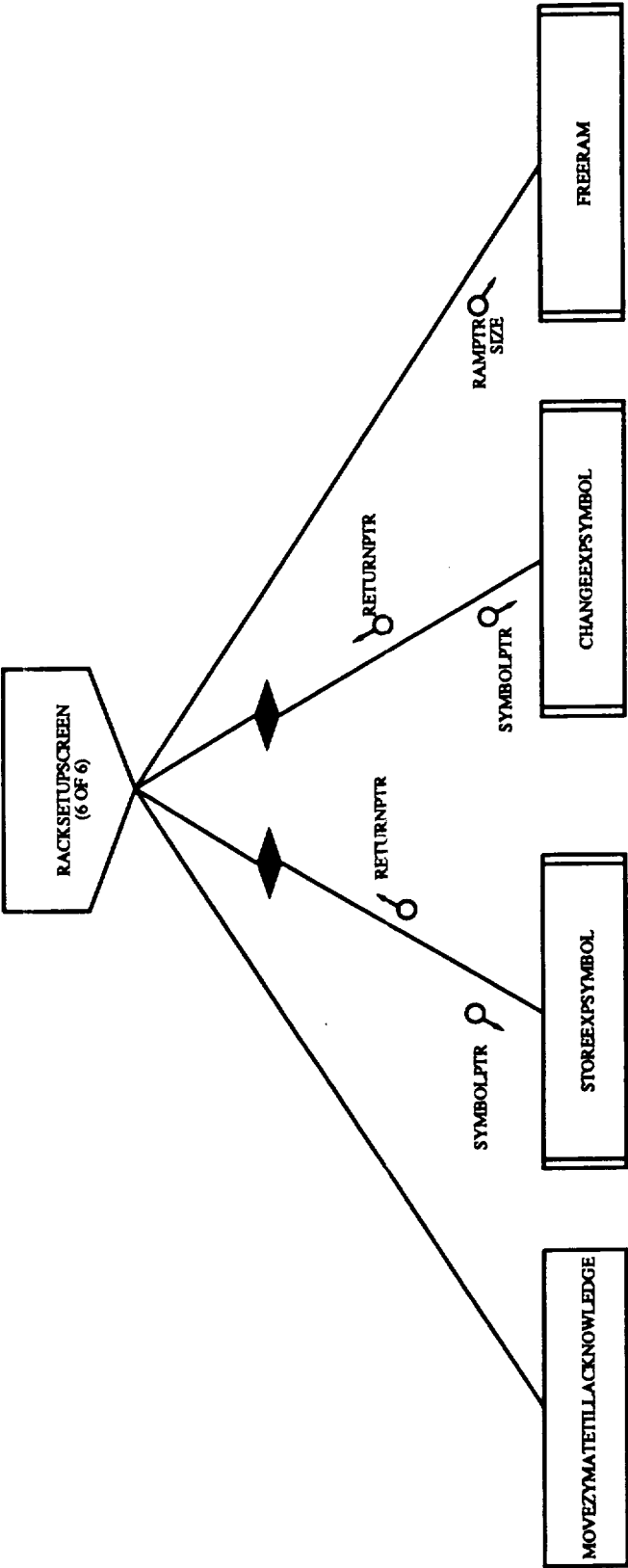




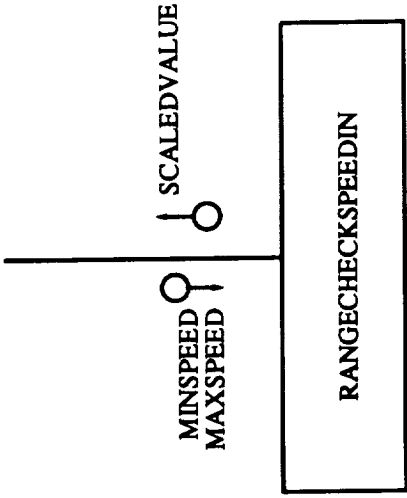


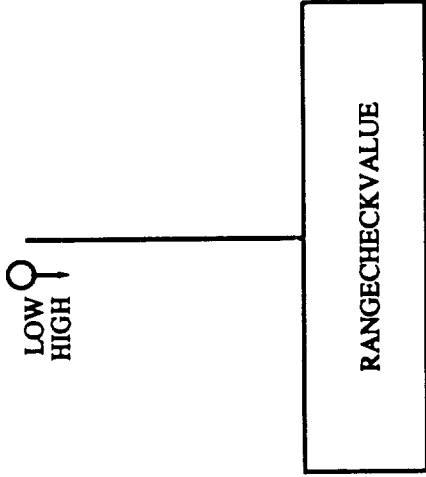


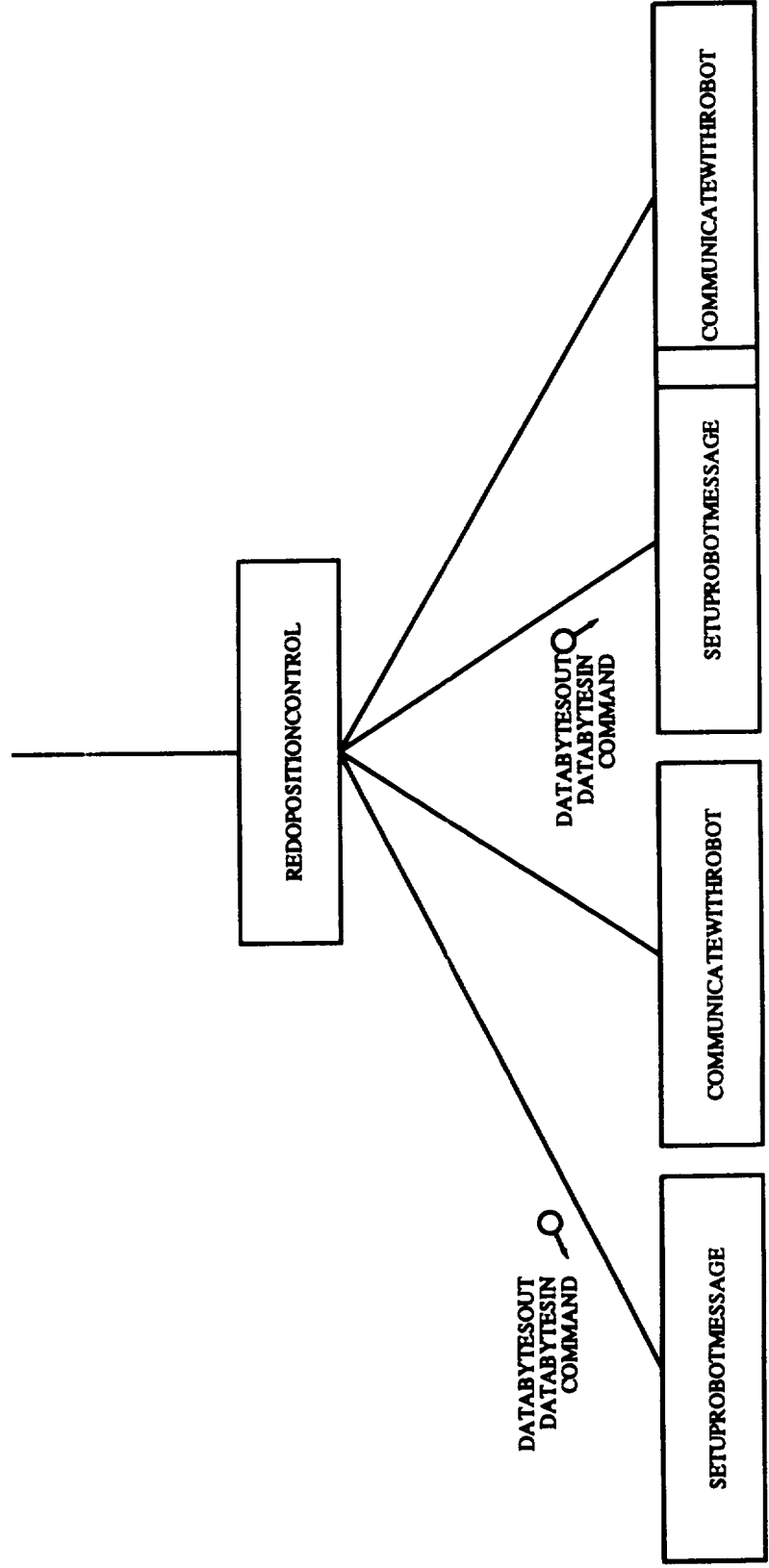




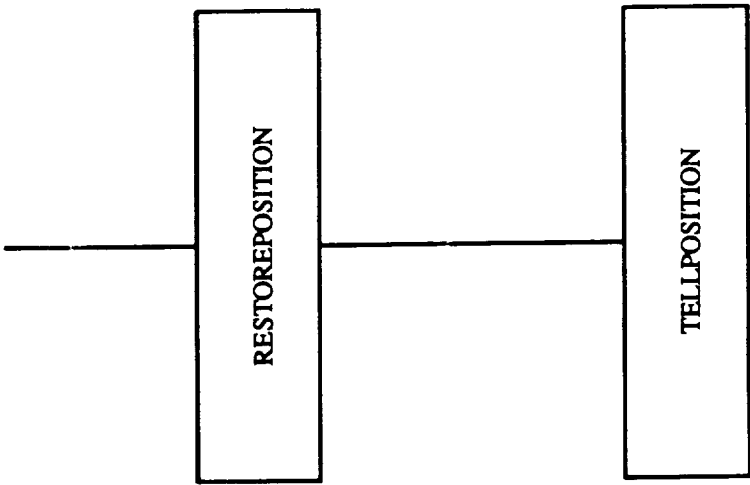
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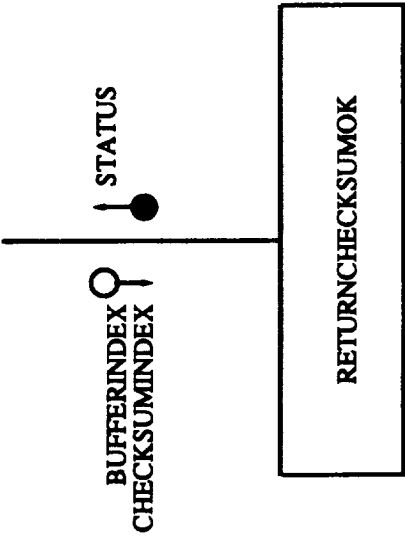


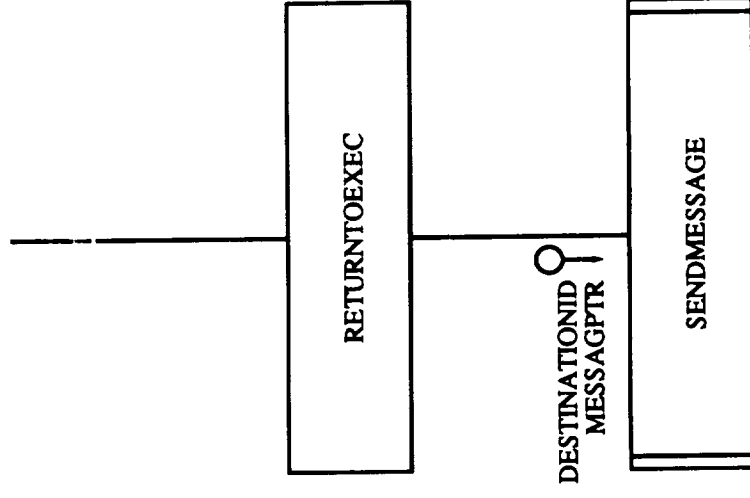


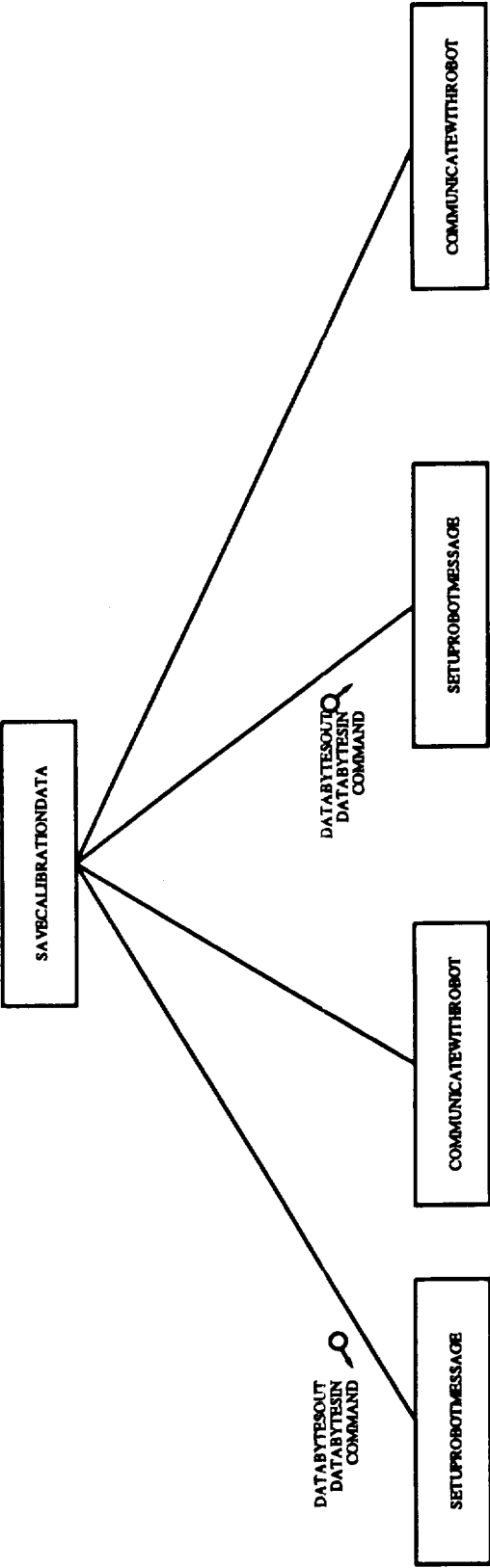


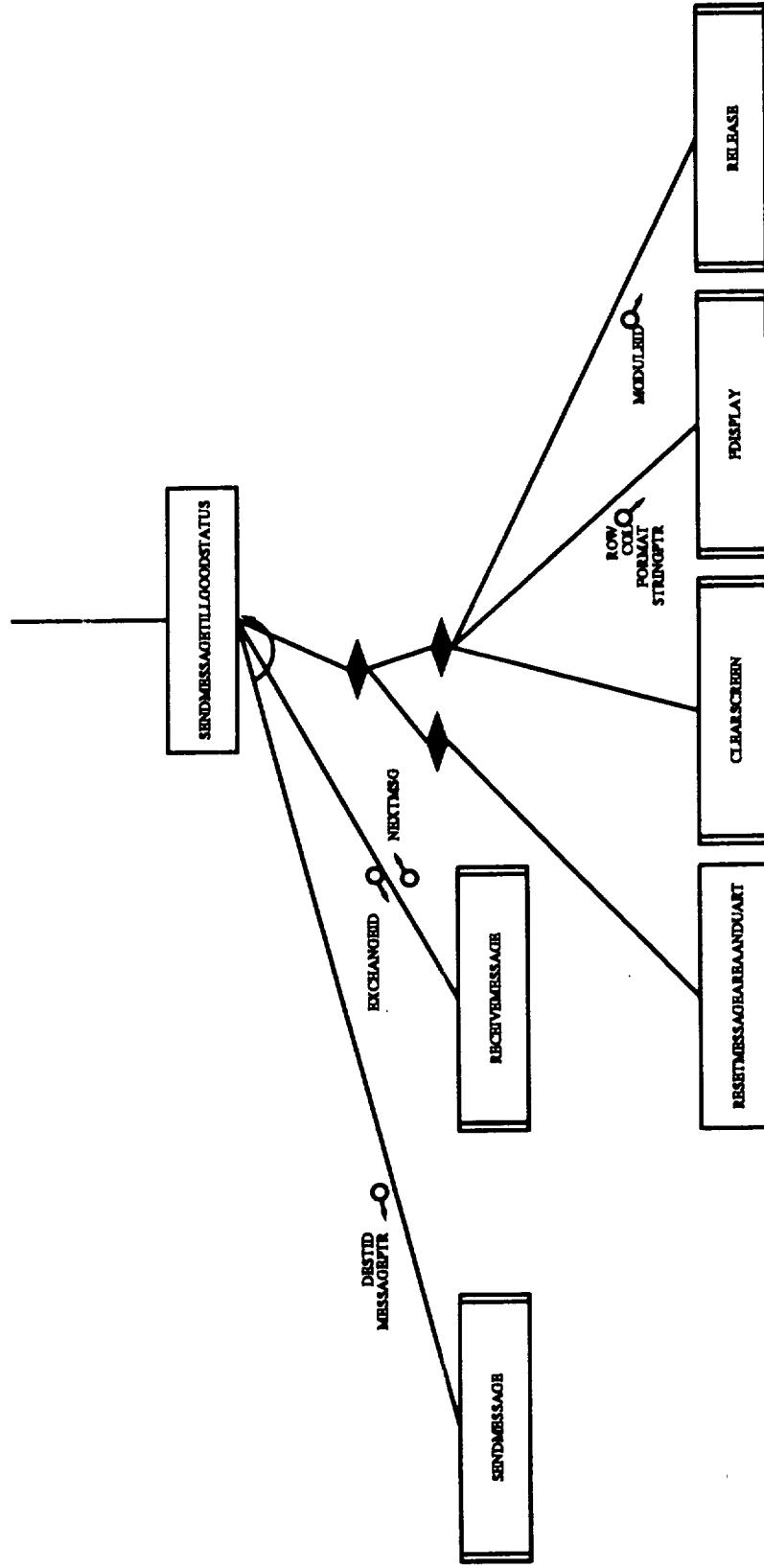
RESETMESSAGEAREAANDUART





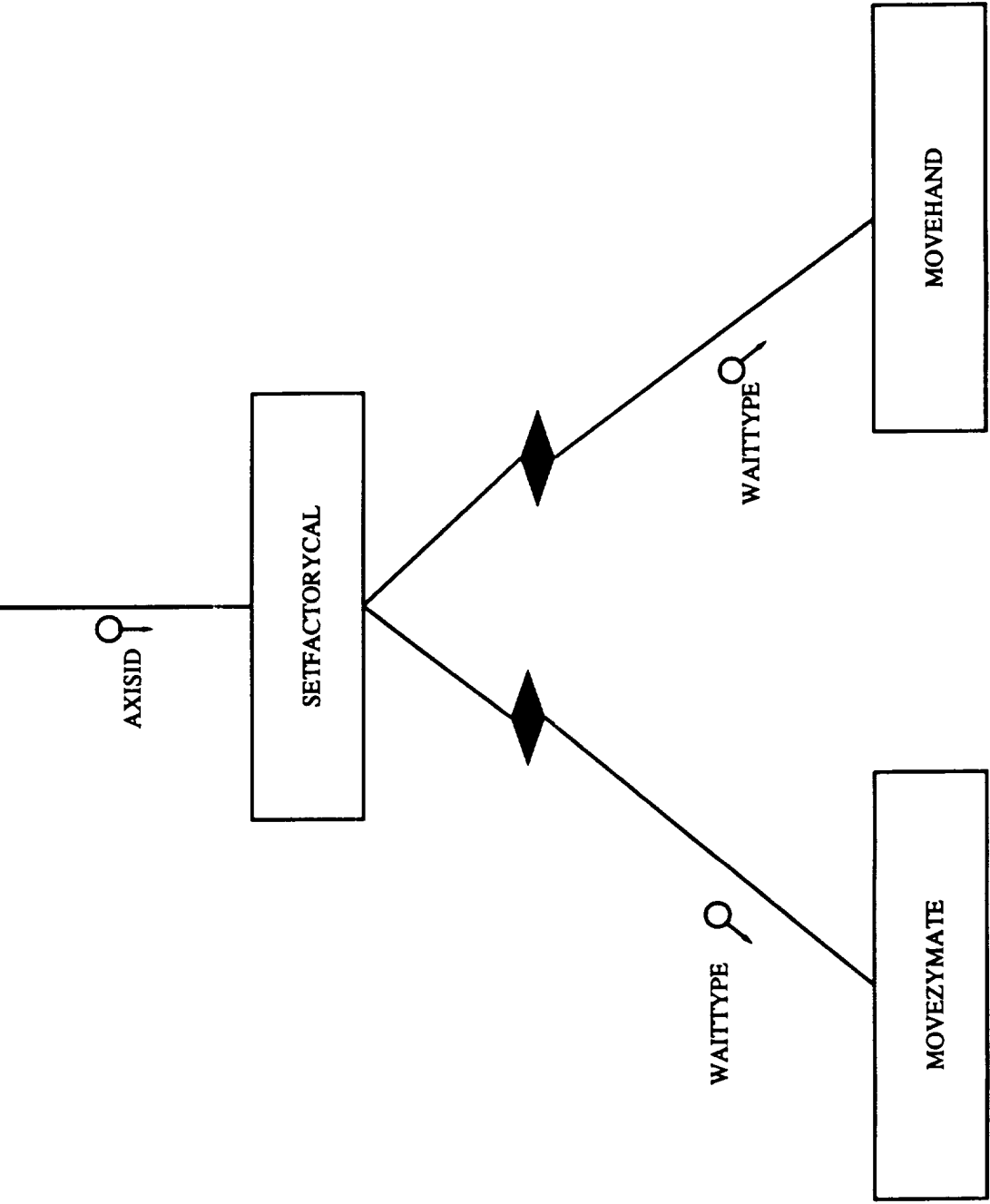


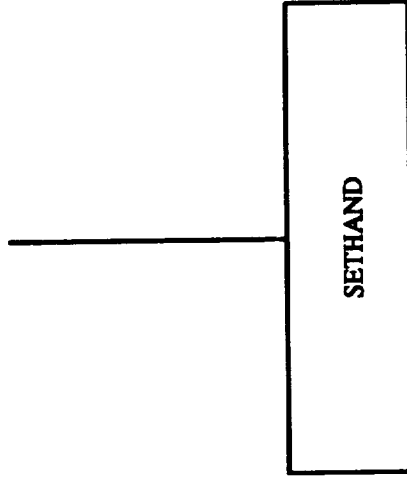






SETABSOLUTE



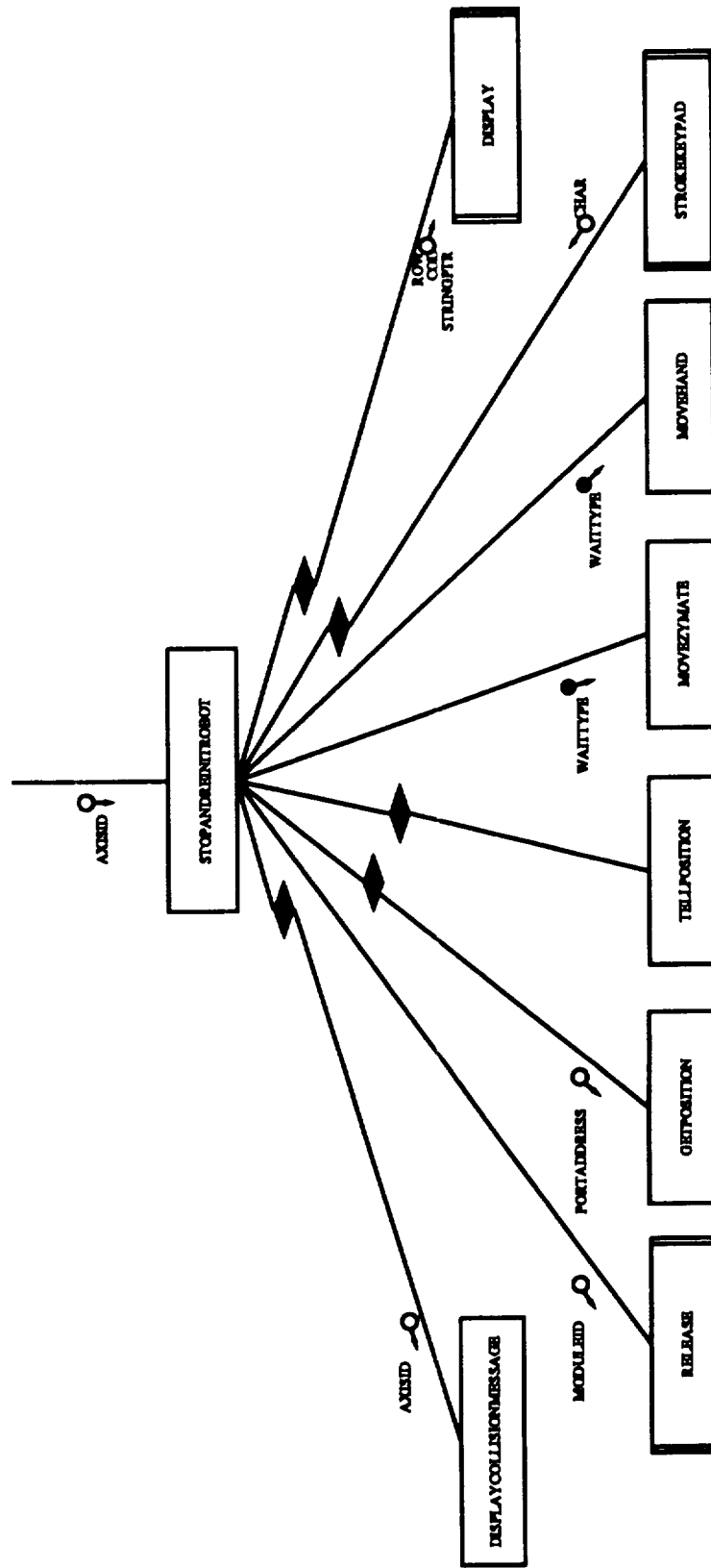


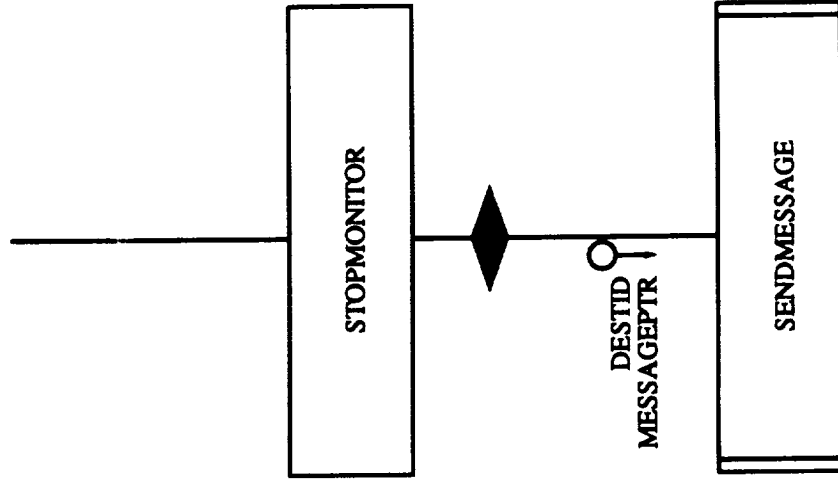
SETRELATIVE

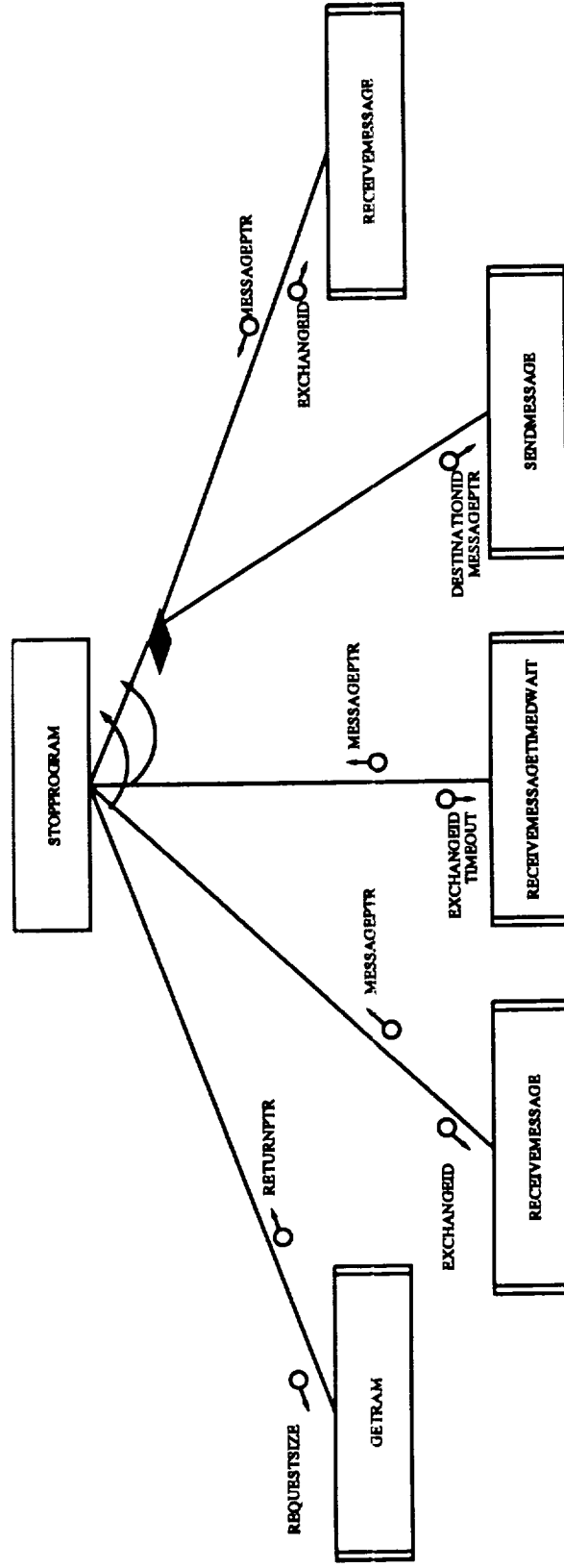
A diagram consisting of a horizontal line extending from the left side of a rectangular box. The box is oriented vertically and contains the text 'SETRELATIVE' in a bold, sans-serif font, centered within the box.

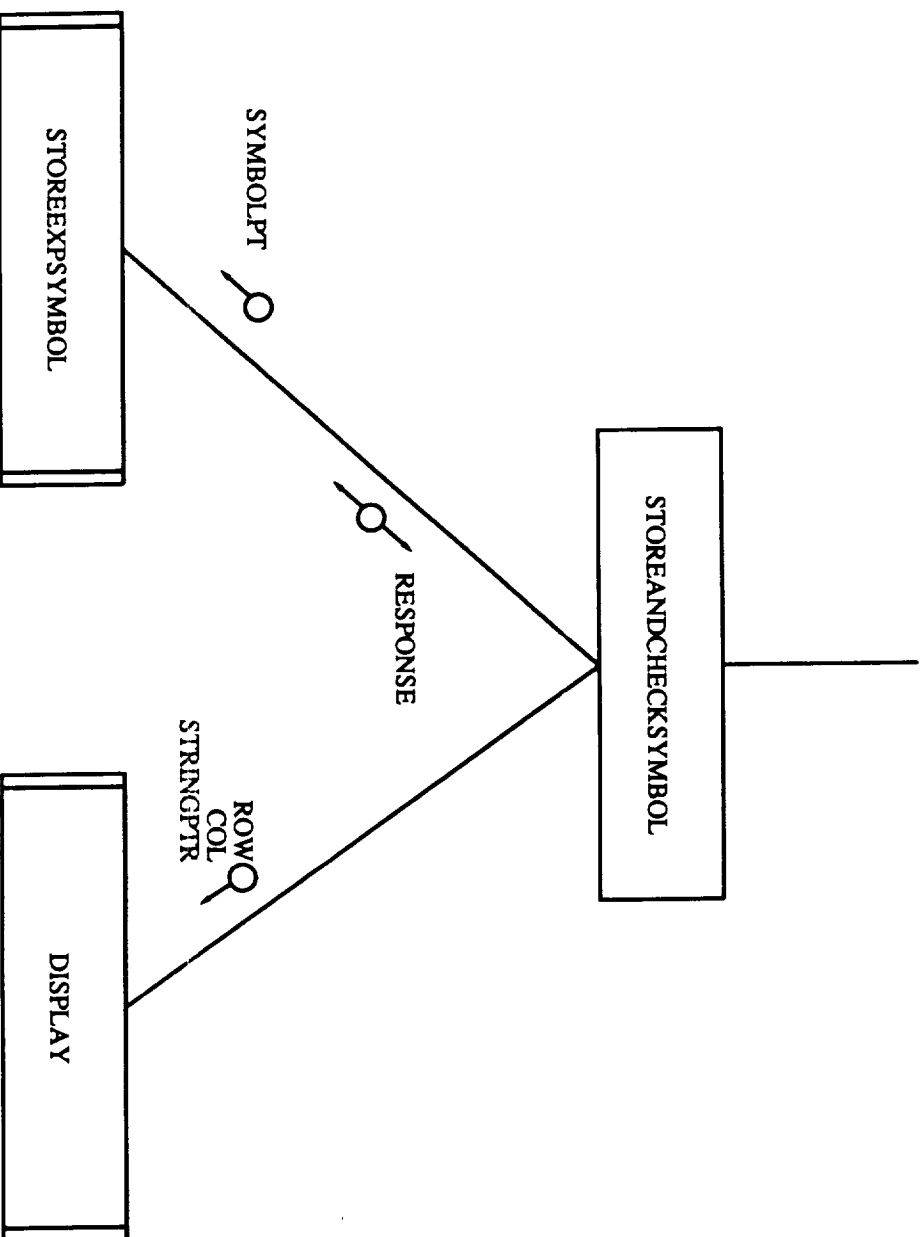
DATABYTESOUT
DATABYTESIN
COMMAND

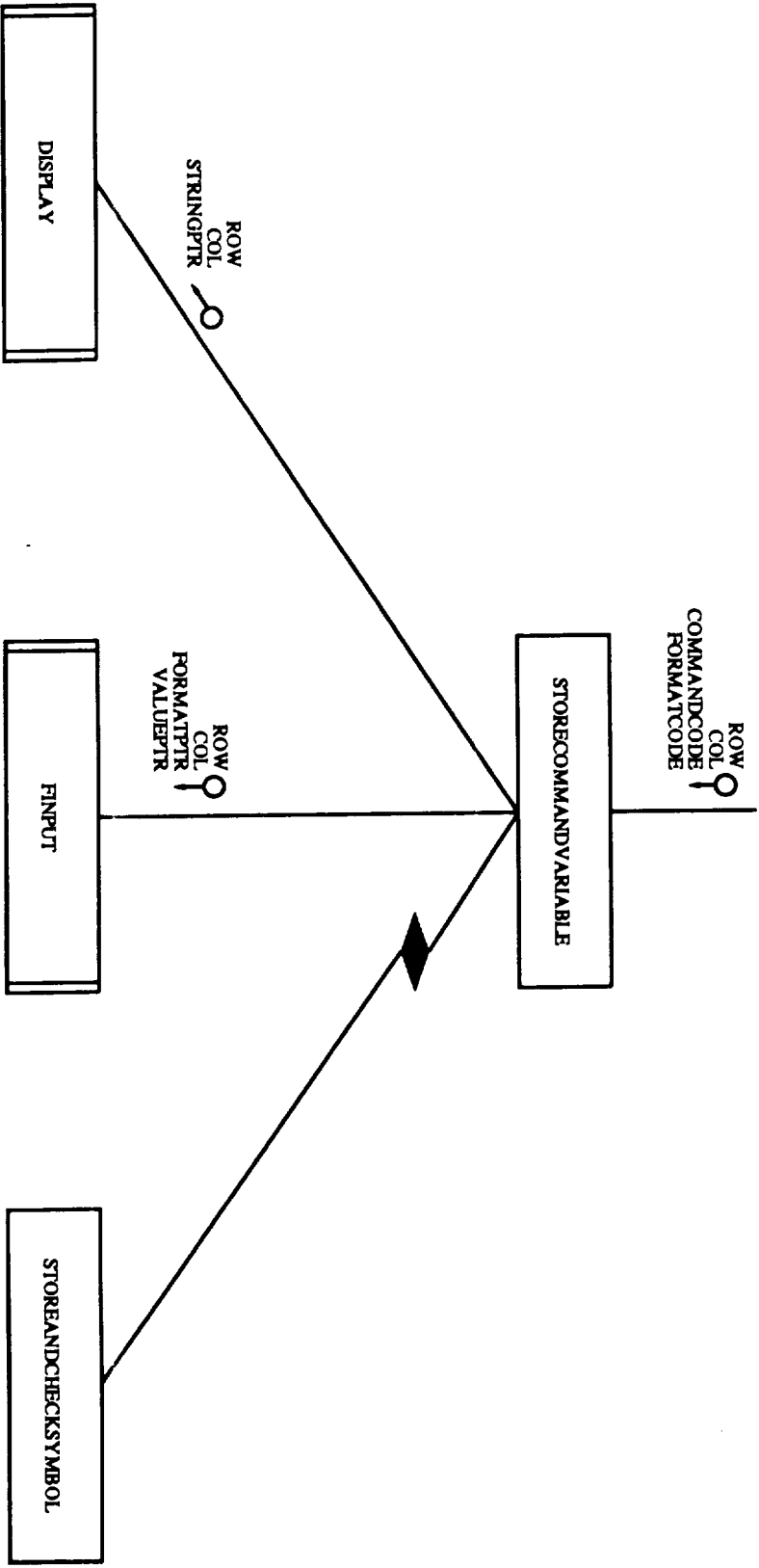
SETUPROBOTMESSAGE

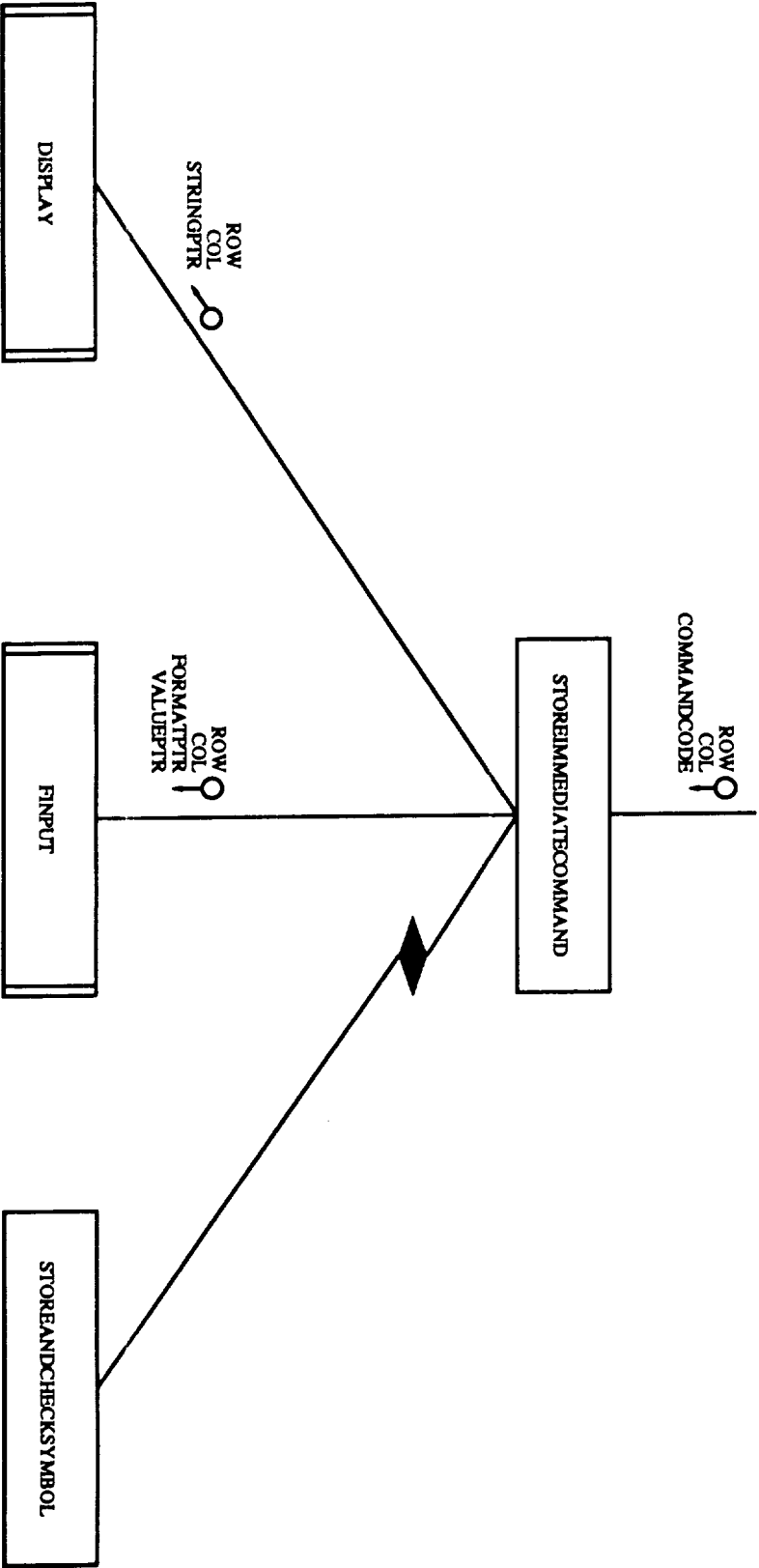


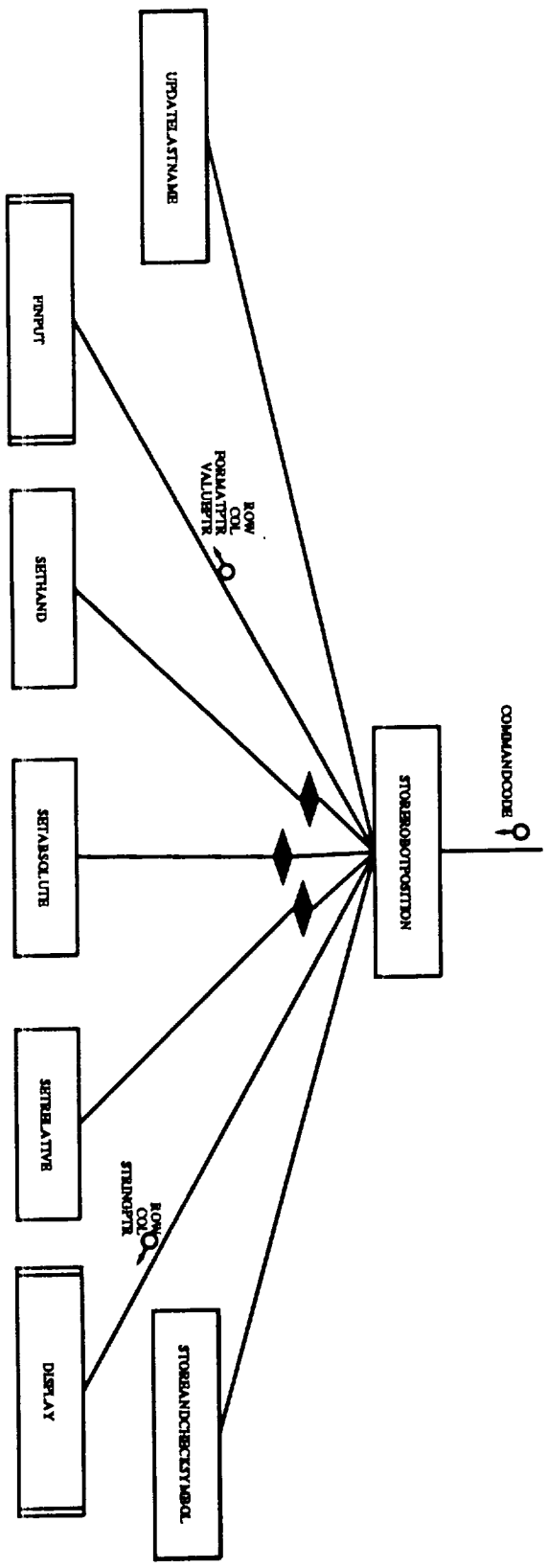


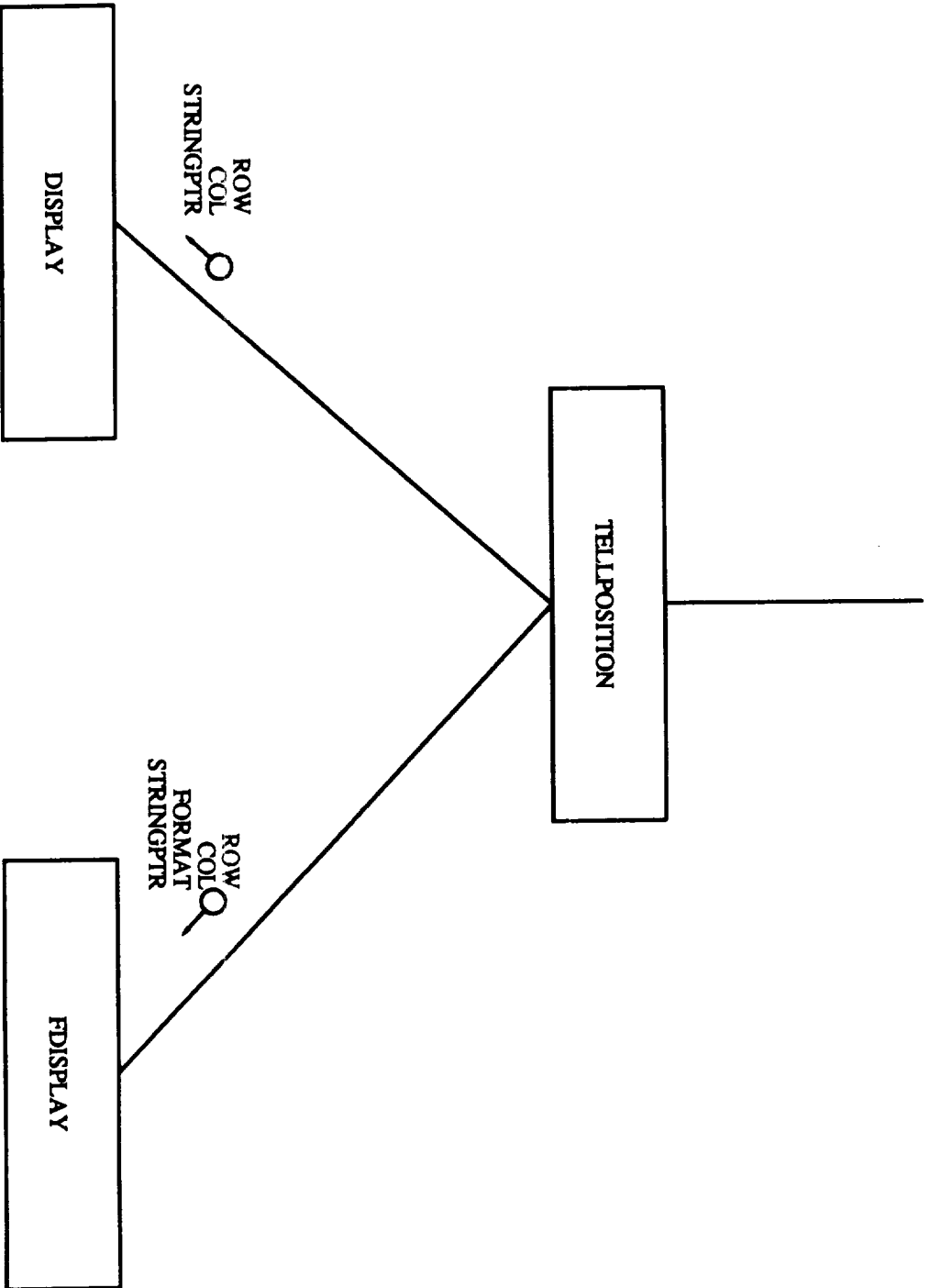


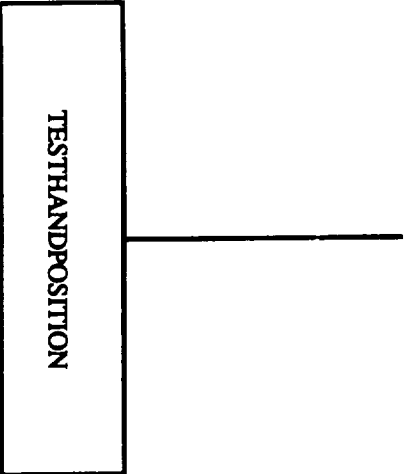


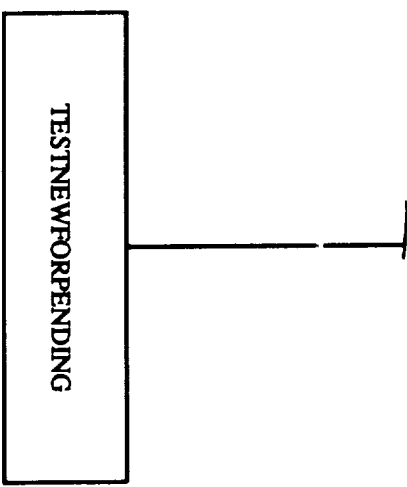


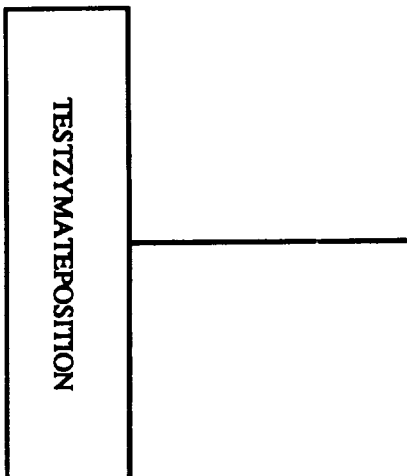


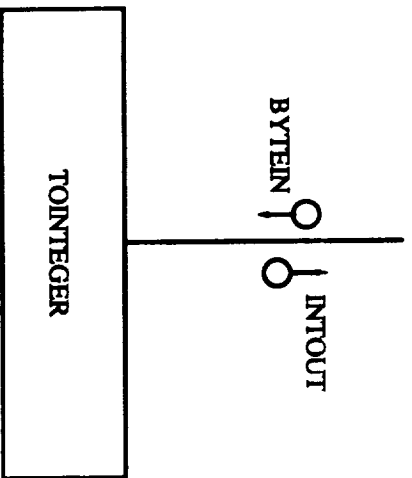


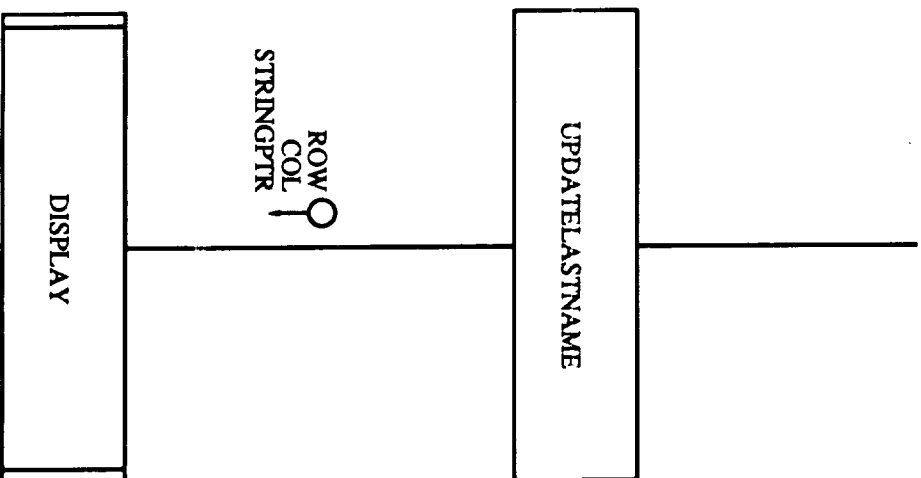


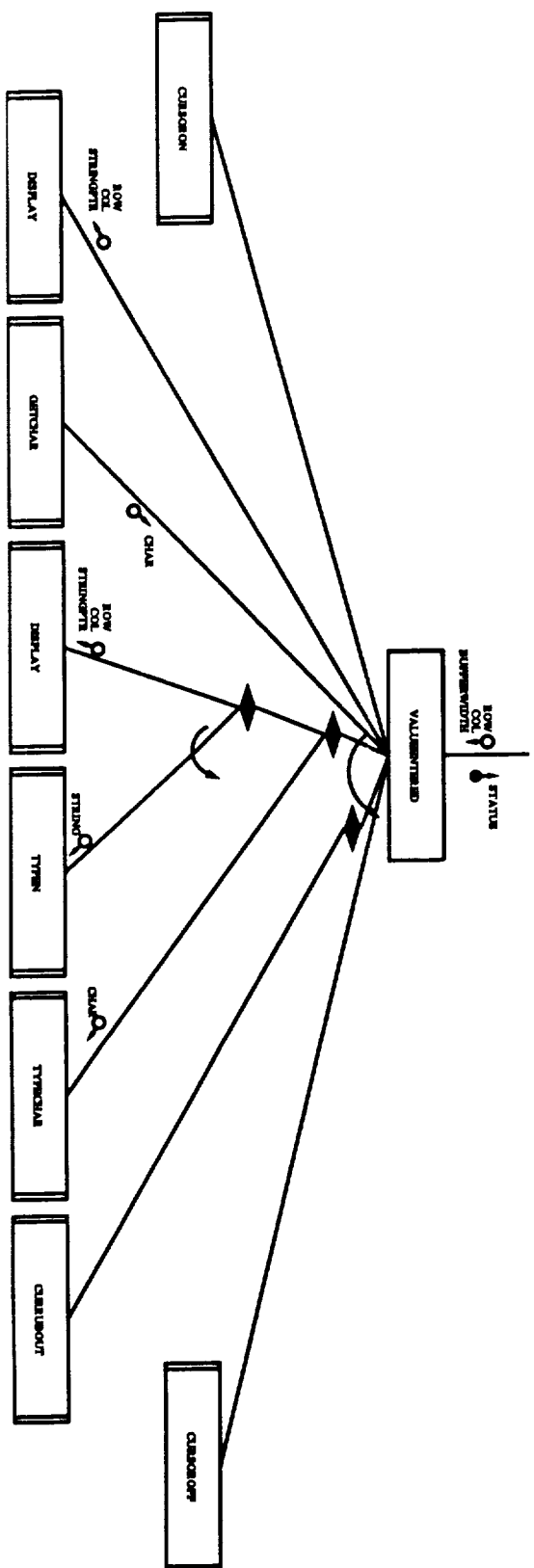


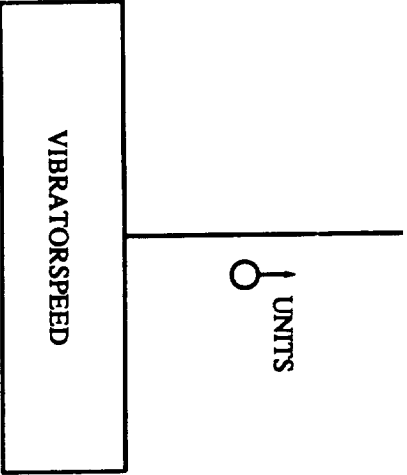


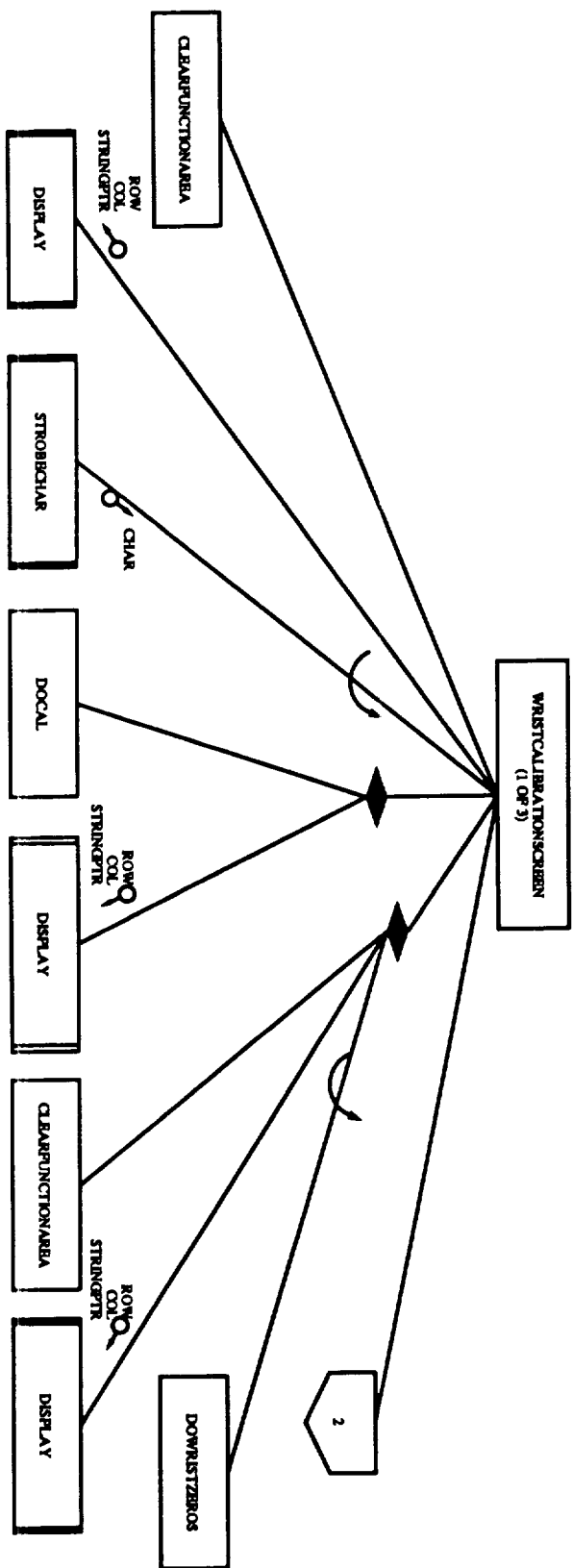


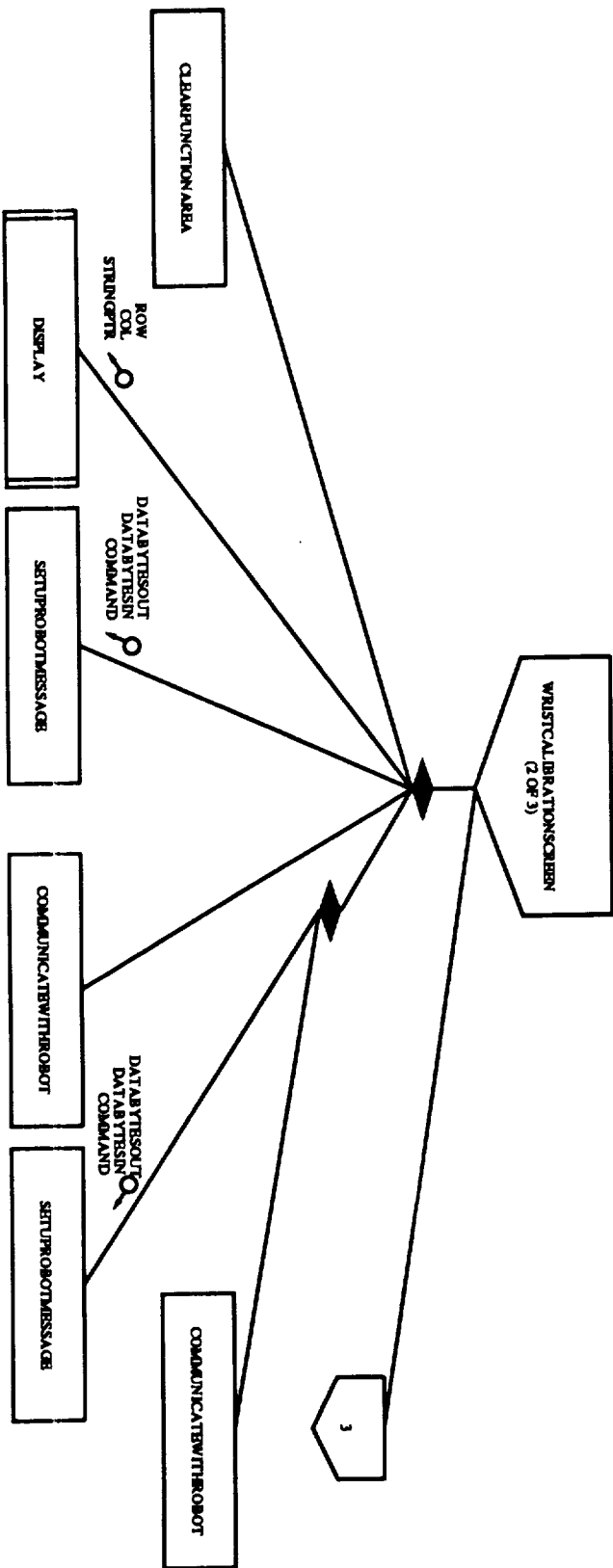


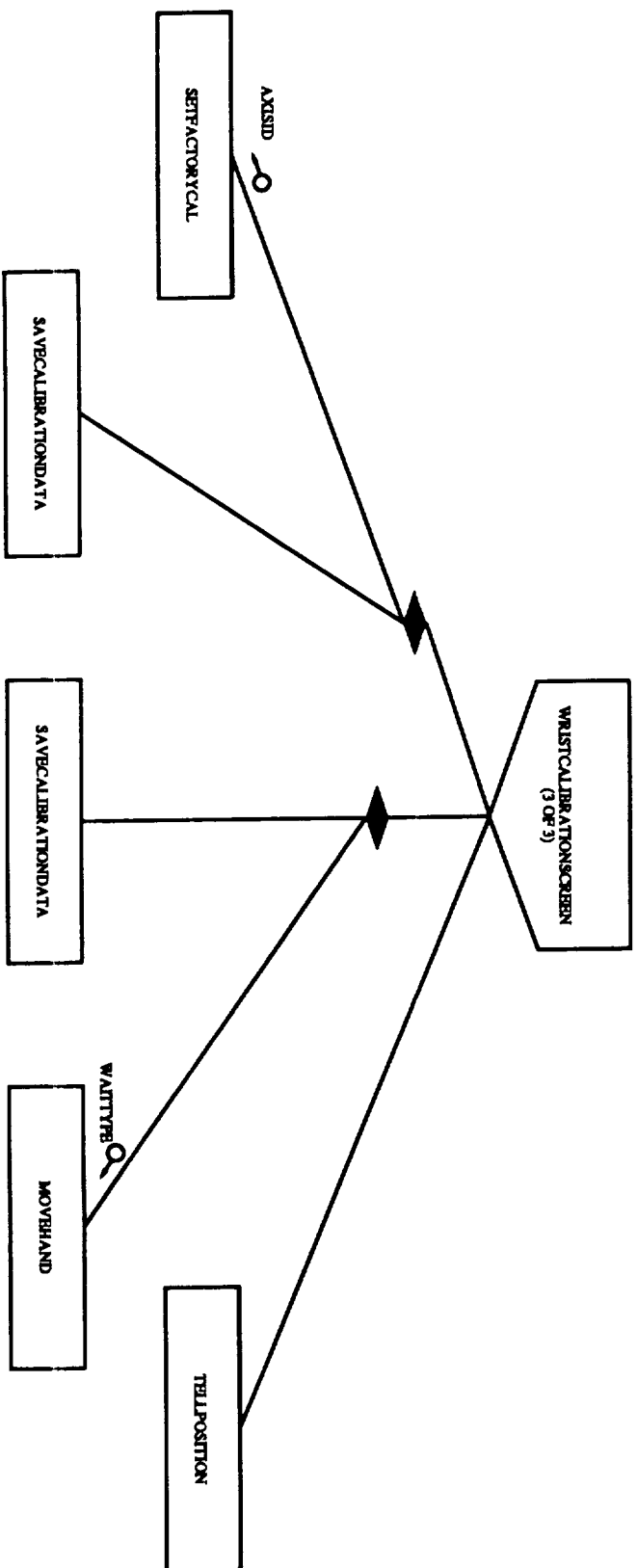


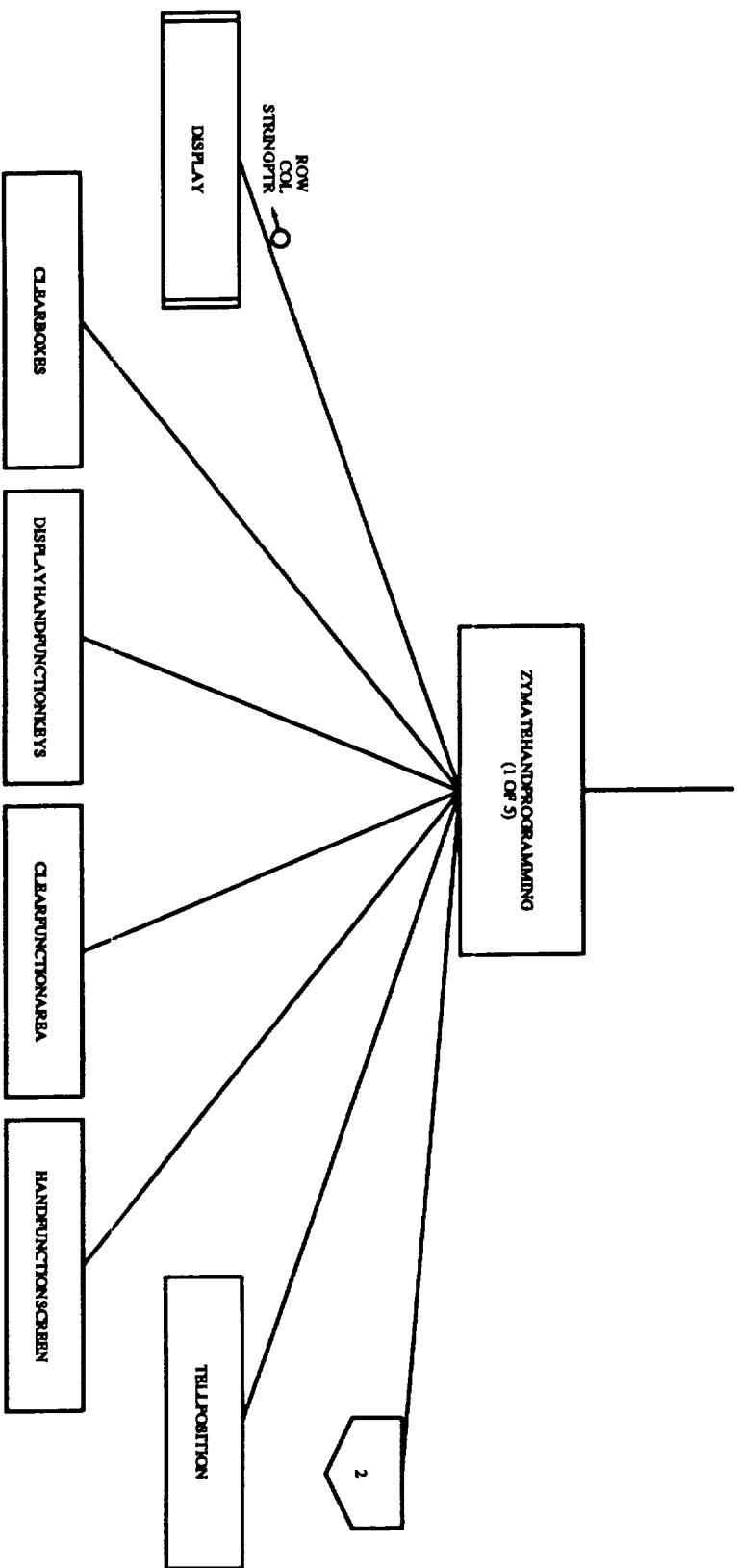


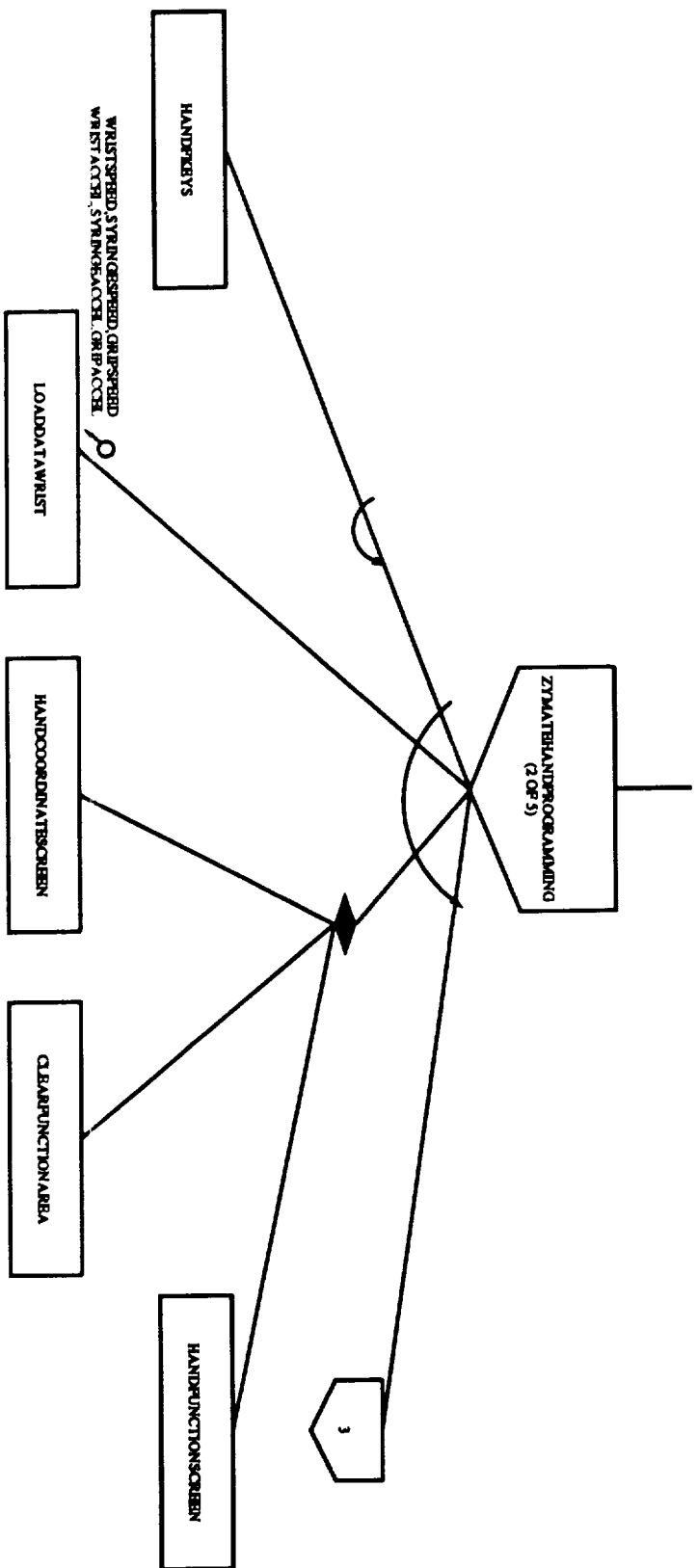


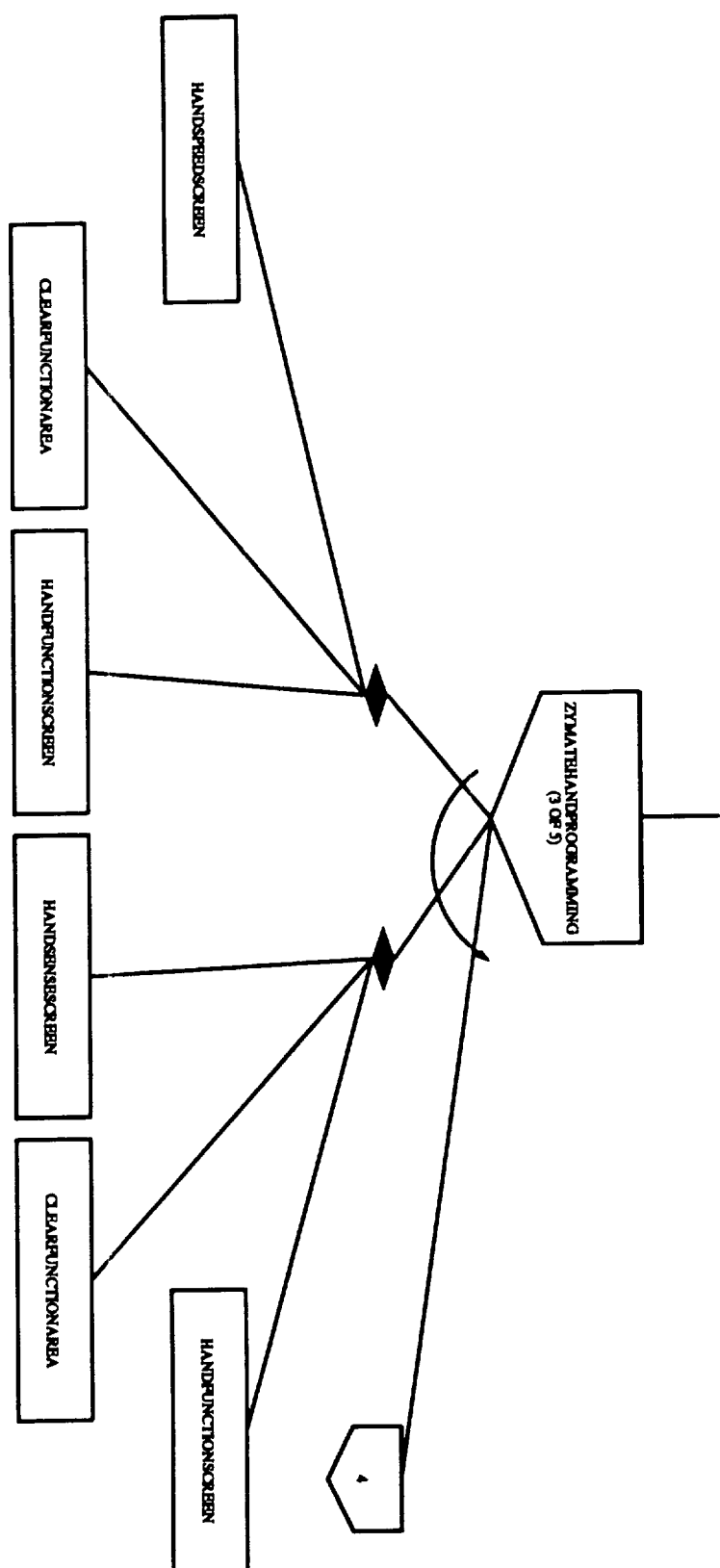


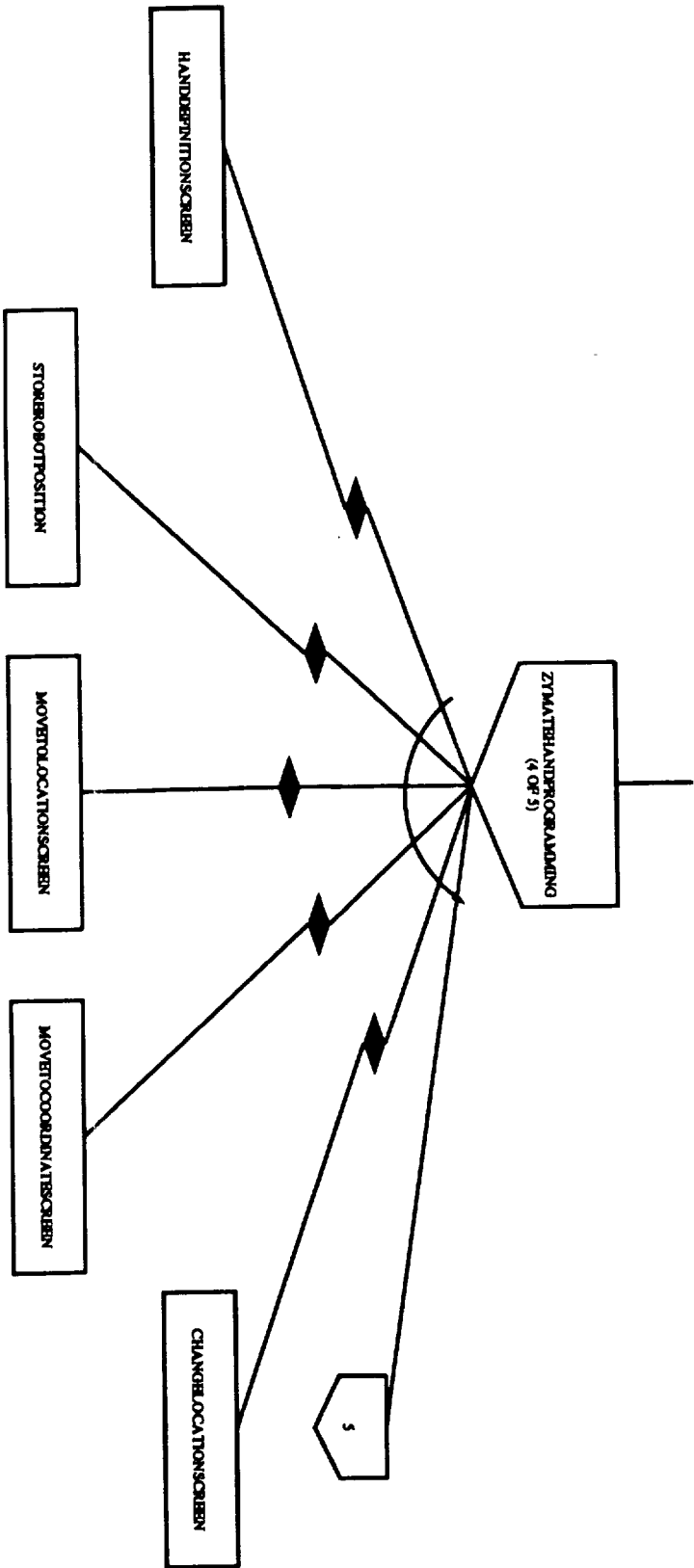


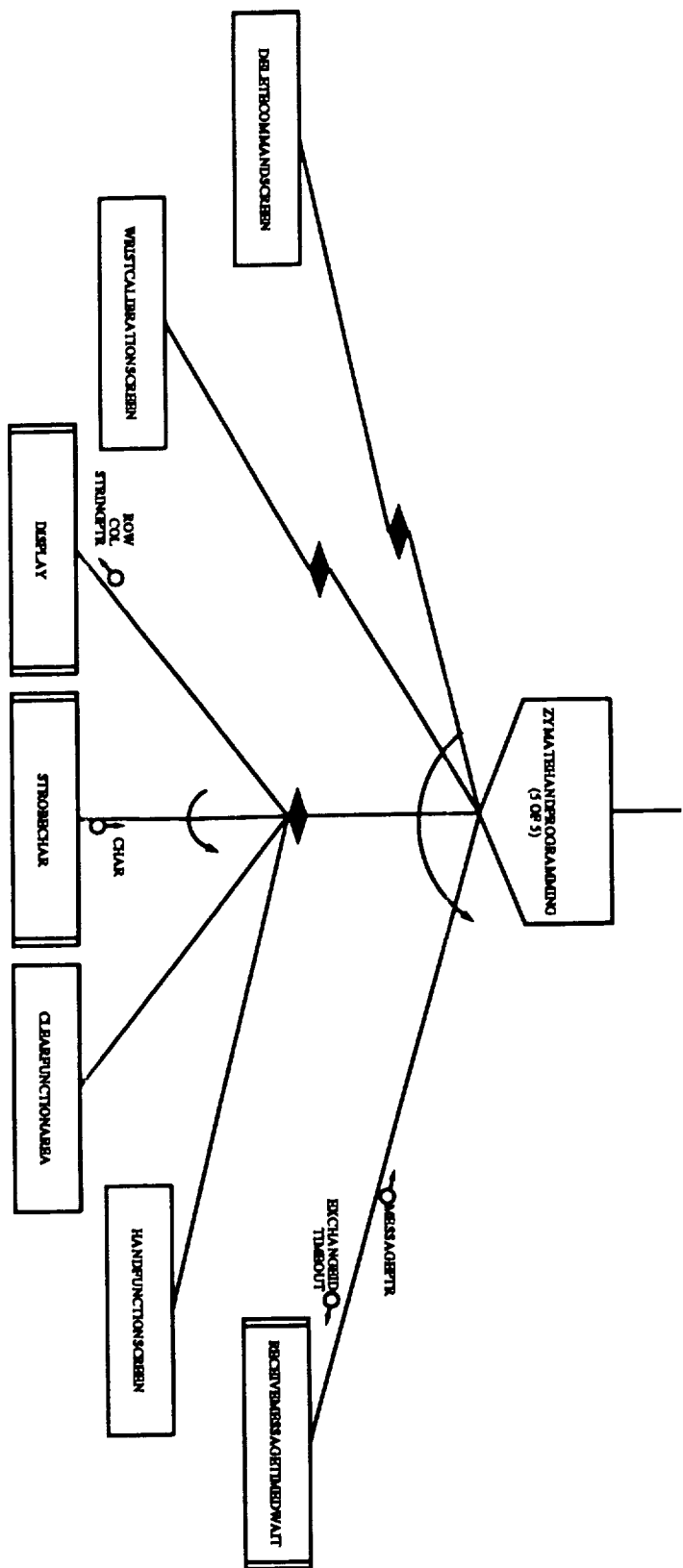


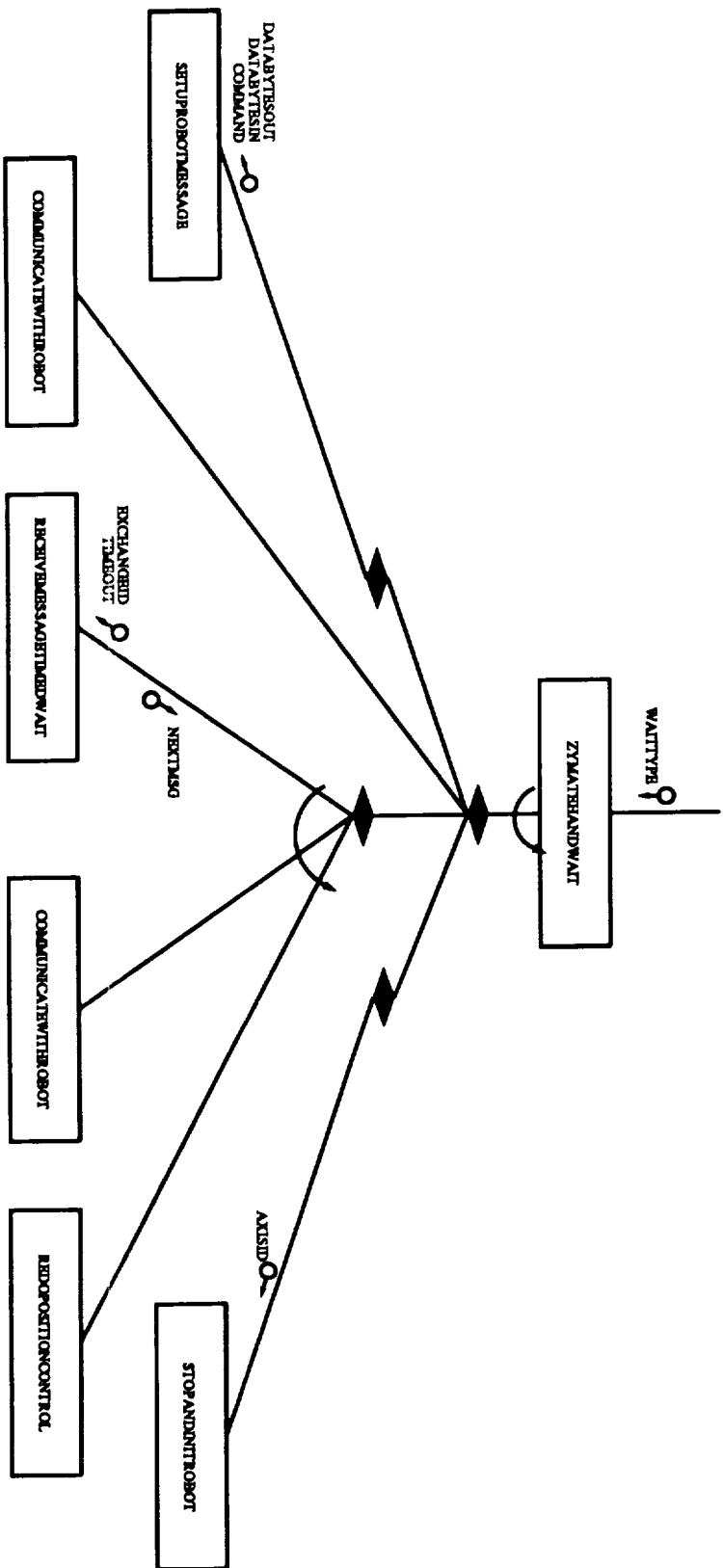


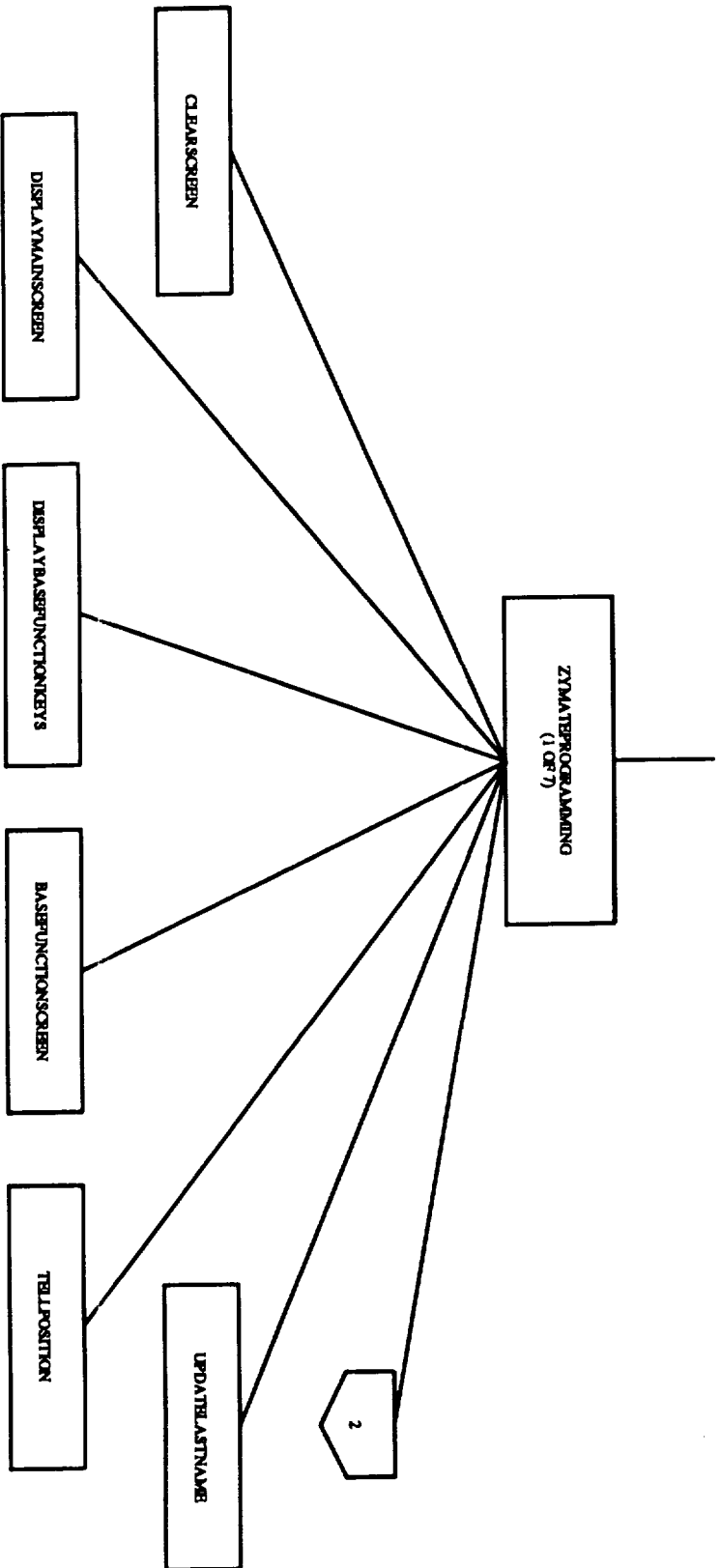


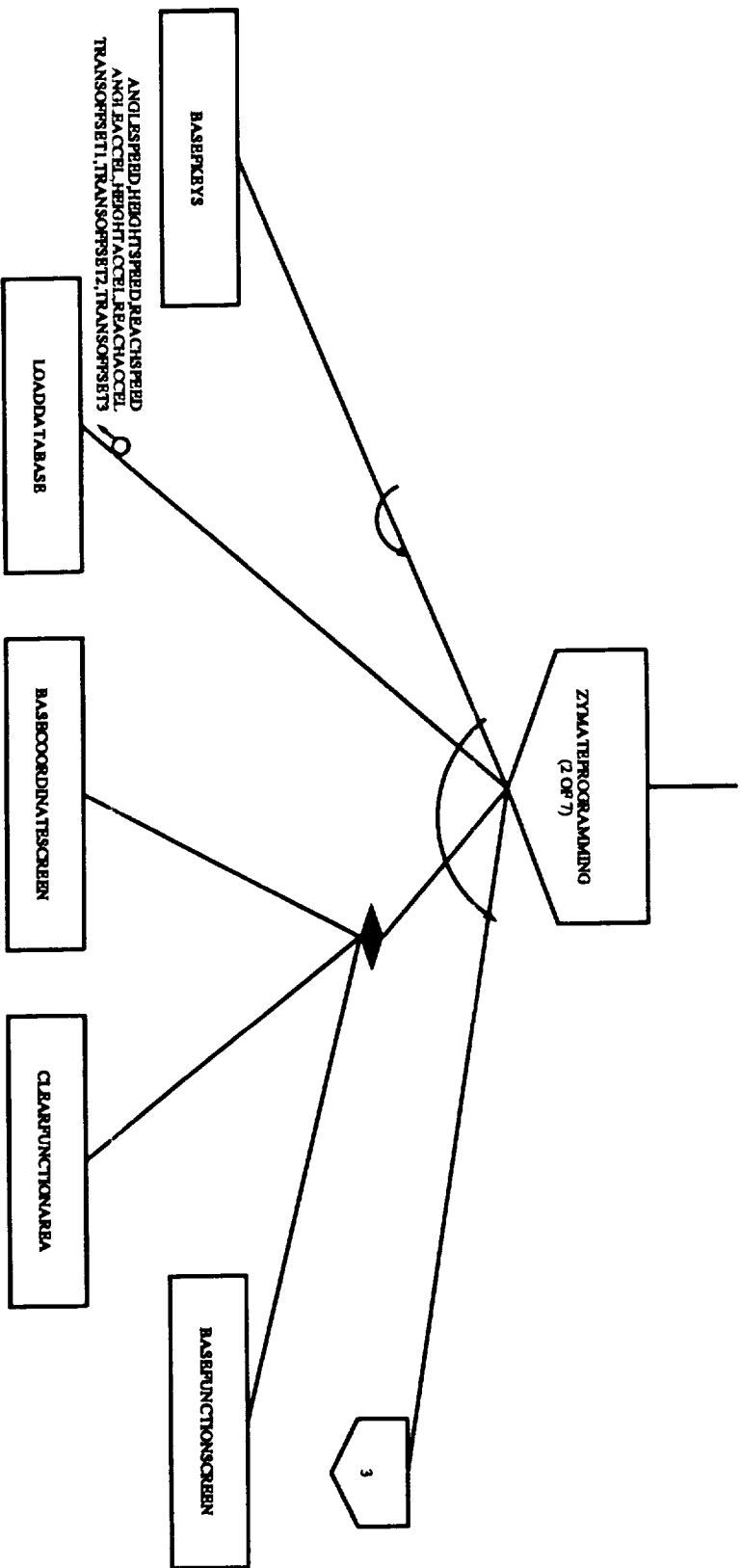












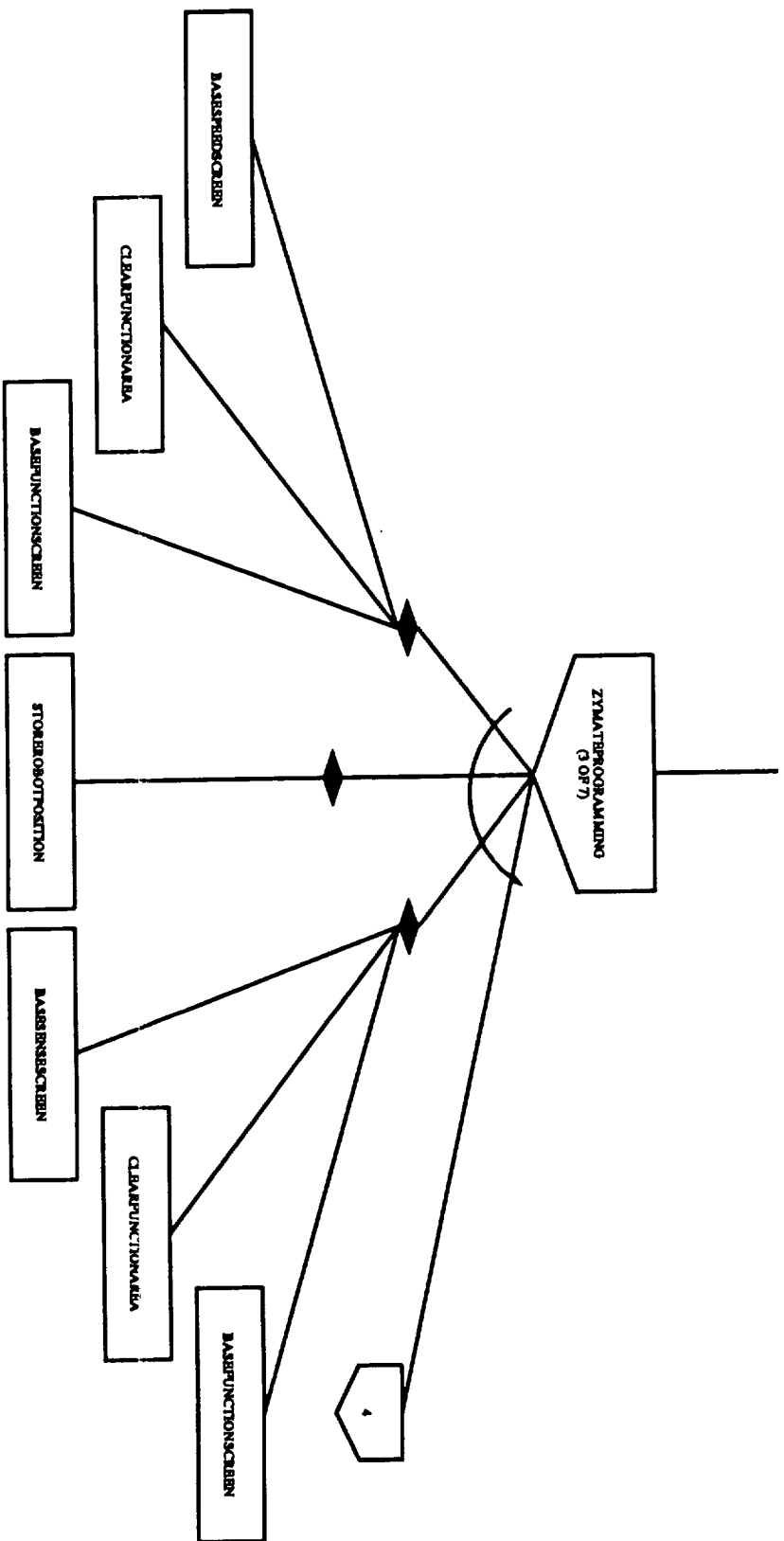
ANGLESPEED,HEIGHTSPEED,REACHSPEED,
ANGLEFACT,HEIGHTFACT,REACHFACT,
TRANSOFFSET1,TRANSOFFSET2,TRANSOFFSET3

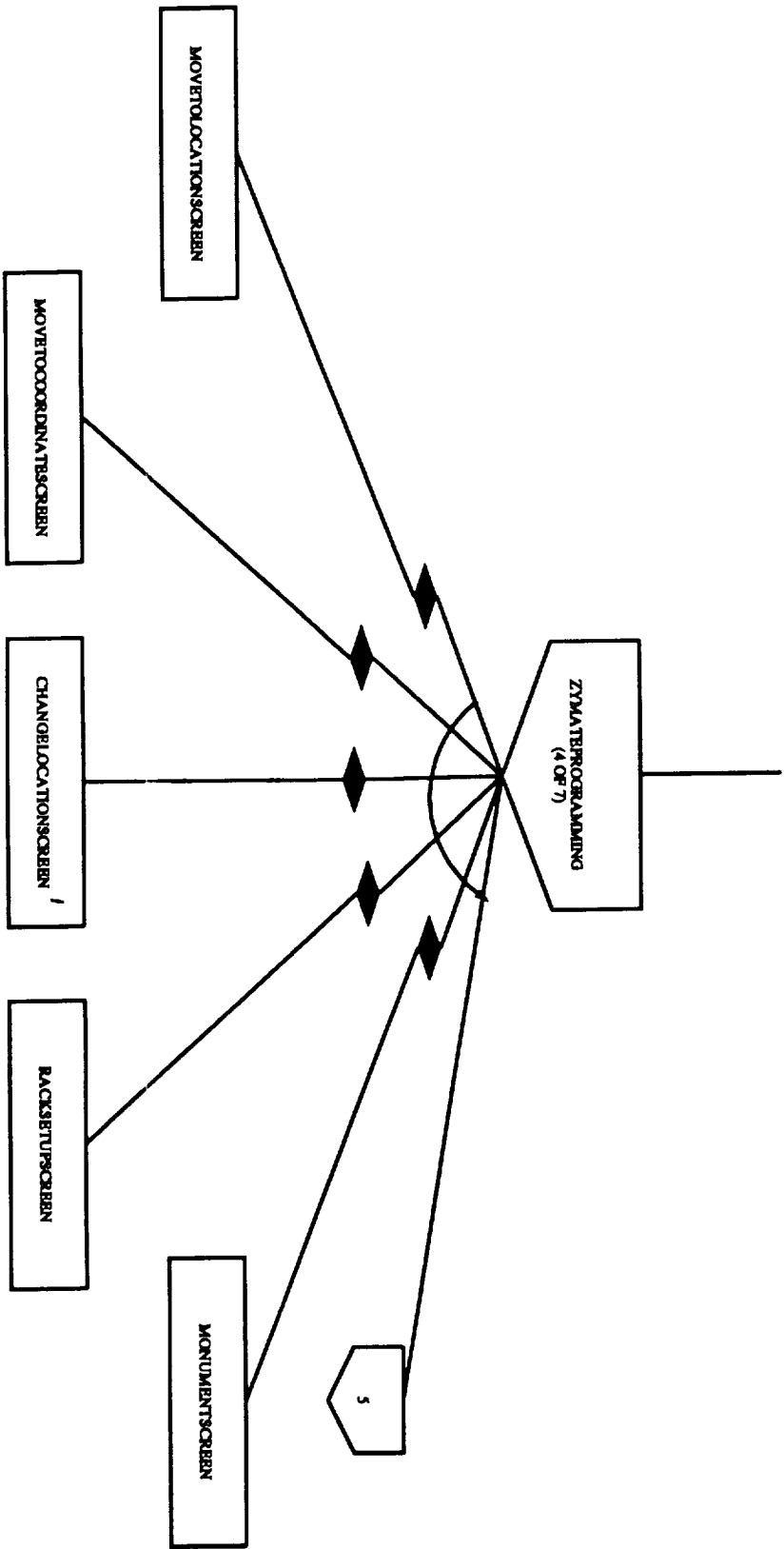
LOADDATABASE

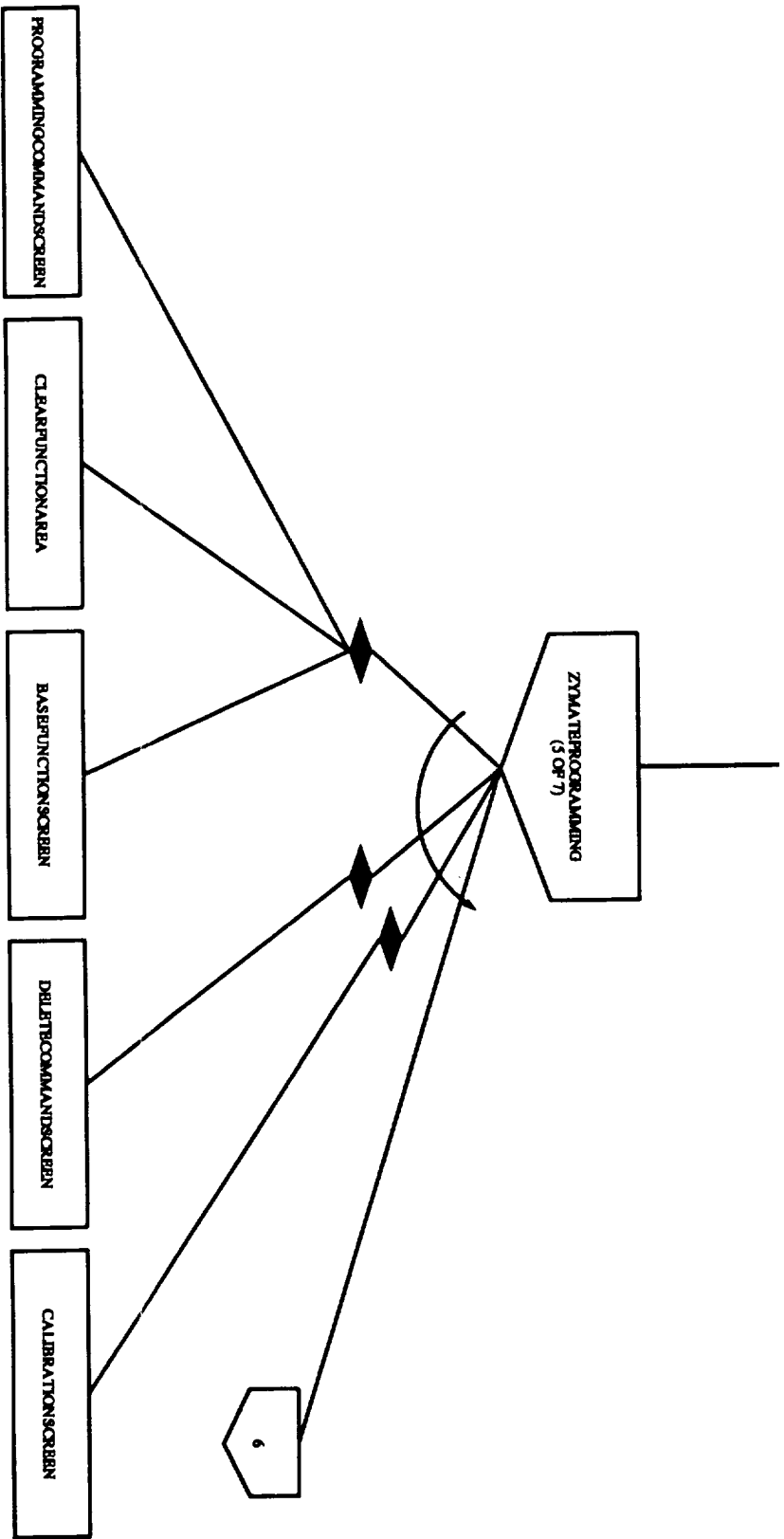
BASECOORDINATESCREEN

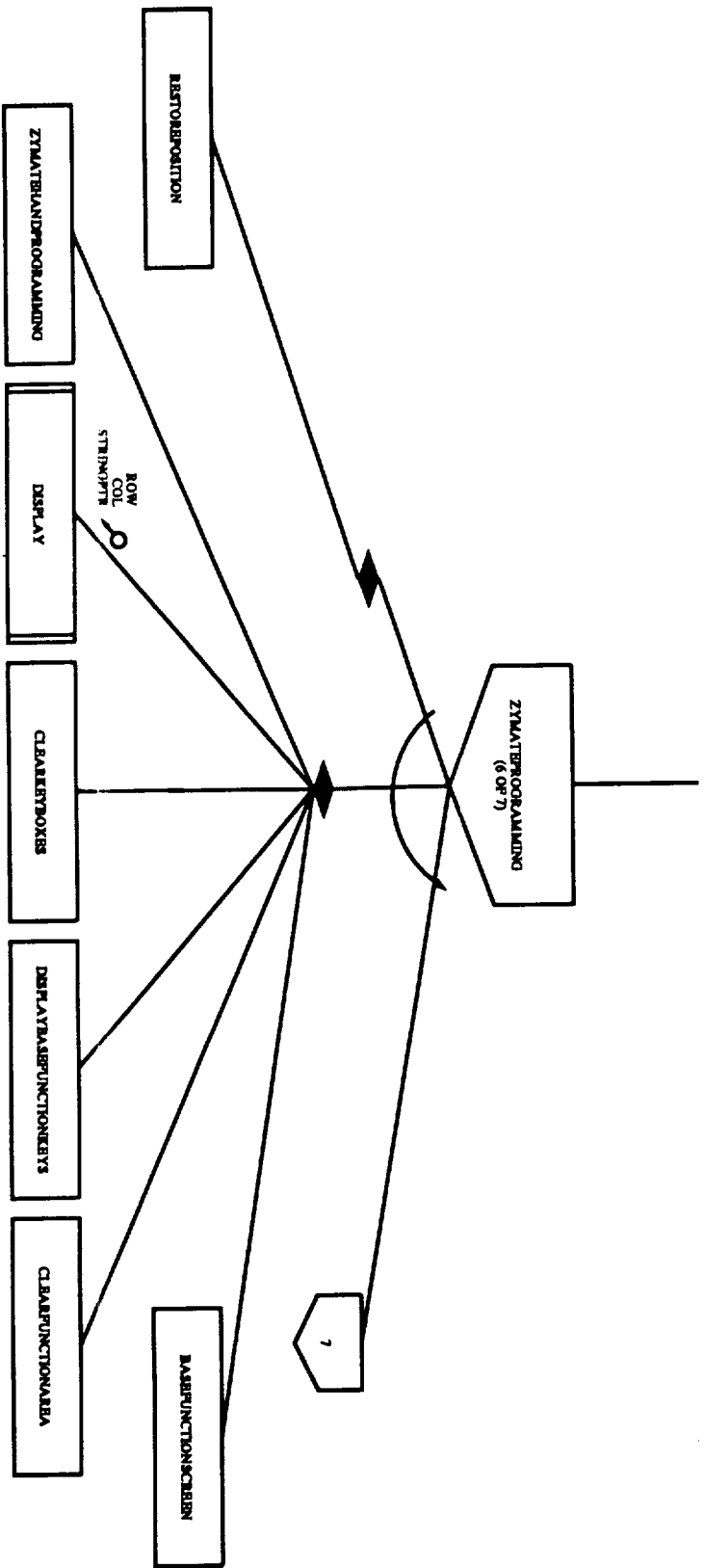
CLEARFUNCTIONAREA

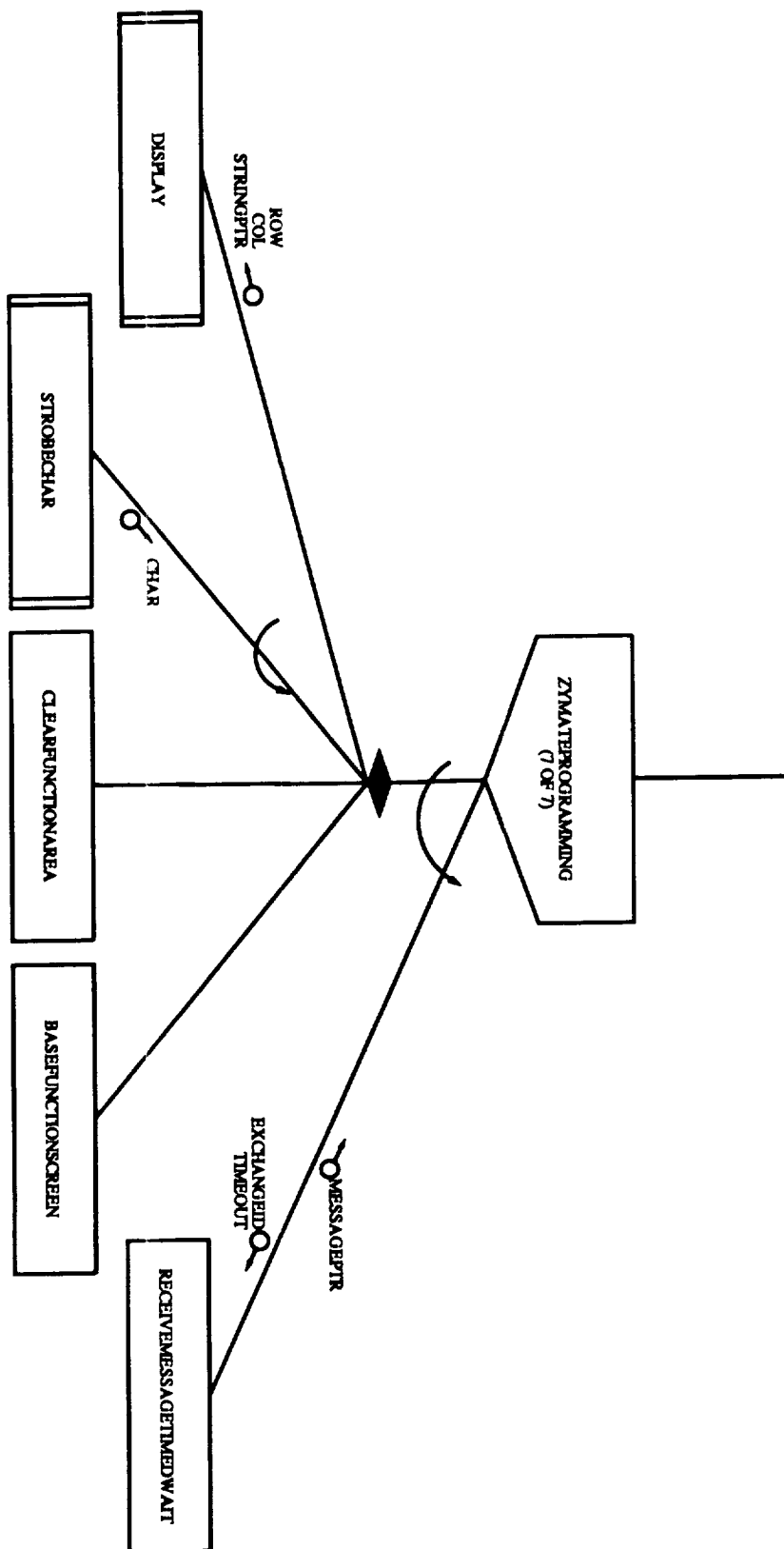
BASEFUNCTIONSCREEN

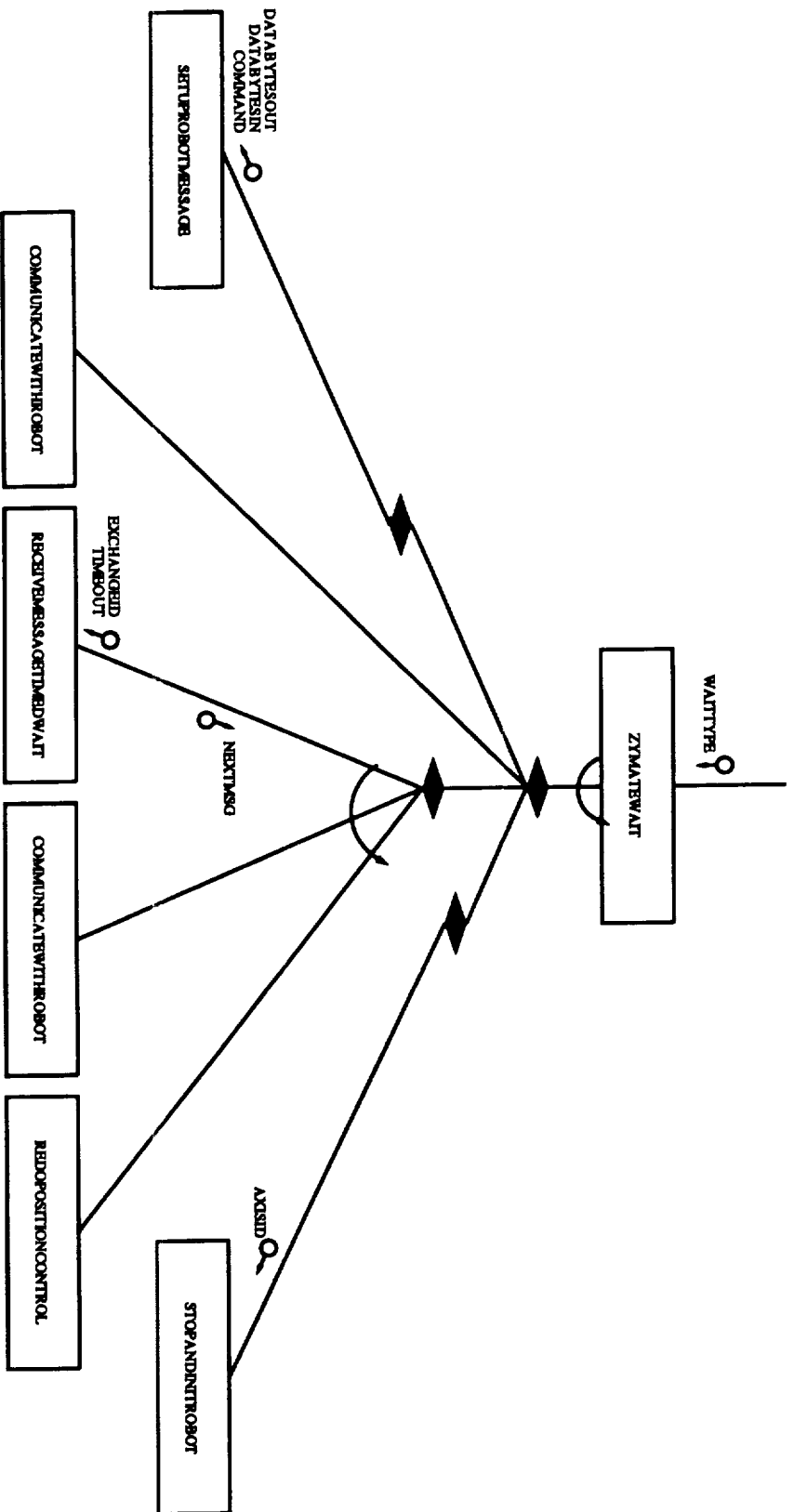












**C-DOC FLOW
STRUCTURE DIAGRAM**

Defined Functions, SUMMARY Graphic TREE# (of CALLER/CALLED flow Structure)

2346 ORCA1.CC	1	INITZYMATE
1331 ORCA2.CC	2	INITZYMATEROBOT
98 ORCA3.CC	3	RESETPROBOTMESSAGEAREAANDUART
	4	..TIME
777 ORCA2.CC	5	GETCALIBRATIONDATA
139 ORCA3.CC	6	SETUPROBOTMESSAGE
	7	..SIZE
228 ORCA3.CC	8	COMMUNICATEWITHROBOT
192 ORCA3.CC	9	COMPUTECHECKSUM
152 ORCA3.CC	10	SENDMESSAGEUNTILGOODSTATUS
98 ORCA3.CC	11	RESETPROBOTMESSAGEAREAANDUART (3)
	12	..SENDMESSAGE RECEIVEMESSAGE CLEARSCREEN FDISPLAY DOUBLE RELEASE
206 ORCA3.CC	13	RETURNCHECKSUMOK
	14	..MOVW
825 ORCA2.CC	15	SETFACTORYCAL
533 ORCA3.CC	16	MOVEZYMATE
475 ORCA3.CC	17	CALCULATEBASEAXISCOUNTS
434 ORCA3.CC	18	TESTZYMATEPOSITION
	19	..DDIV DMUL DOUBLE UNSIGN LOW
ORCA3.CC	20	ZYMAWAIT
ORCA3.CC	21	SETUPROBOTMESSAGE (6)
ORCA3.CC	22	COMMUNICATEWITHROBOT (8)
308 ORCA3.CC	23	REDOPOSITIONCONTROL
139 ORCA3.CC	24	SETUPROBOTMESSAGE (6)
228 ORCA3.CC	25	COMMUNICATEWITHROBOT (8)
	26	..LOW HIGH
329 ORCA2.CC	27	STOPANDREINITROBOT
205 ORCA2.CC	28	DISPLAYCOLLISIONMESSAGE
	29	..DISPLAY TYPEN SHR
80 ORCA2.CC	30	GETPOSITION
139 ORCA3.CC	31	SETUPROBOTMESSAGE (6)
228 ORCA3.CC	32	COMMUNICATEWITHROBOT (8)
	33	..DDIV DOUBLE DMUL LOW SIGNED
970 ORCA3.CC	34	TELLPOSITION
	35	..DISPLAY UNSIGN SAR FDISPLAY IABS
329 ORCA2.CC	36	MOVEZYMATE (RECURSVE)
828 ORCA3.CC	37	MOVEHAND
750 ORCA3.CC	38	CALCULATEHANDAXISCOUNTS
687 ORCA3.CC	39	TESTHANDPOSITION
	40	..LOW DOUBLE DDIV DMUL UNSIGN IABS
767 ORCA3.CC	41	ZYMAHANDWAIT
139 ORCA3.CC	42	SETUPROBOTMESSAGE (6)
228 ORCA3.CC	43	COMMUNICATEWITHROBOT (8)
308 ORCA3.CC	44	REDOPOSITIONCONTROL (23)
ORCA3.CC	45	STOPANDREINITROBOT (RECURSVE)
	46	..TYPEN TYPECLF RECEIVEMESSAGETIMEDWAIT
201 ORCA3.CC	47	DOPOSITIONCONTROL
139 ORCA3.CC	48	SETUPROBOTMESSAGE (6)
228 ORCA3.CC	49	COMMUNICATEWITHROBOT (8)

250 ORCA3.CC	50	STOPMONITOR
	51	..SENDMESSAGE
	52	..LOW HIGH
	53	..TYPEN DISPLAY TYPECRLF RELEASE STROBEKEYPAD LAST
	54	..TYPEN SHR TYPECRLF RECEIVEMESSAGETIMEDWAIT
484 ORCA3.CC	55	LOADDATABASE
139 ORCA3.CC	56	SETUPROBOTMESSAGE (6)
228 ORCA3.CC	57	COMMUNICATEWITHROBOT (8)
261 ORCA3.CC	58	DOPOSITIONCONTROL (47)
	59	..UNSIGN IABS
828 ORCA3.CC	60	MOVEHAND (37)
80 ORCA2.CC	61	GETPOSITION (30)
533 ORCA3.CC	62	MOVEZYMATE (16)
828 ORCA3.CC	63	MOVEHAND (37)
330 ORCA3.CC	64	ZYMATEWAIT (20)
767 ORCA3.CC	65	ZYMATEHANDWAIT (41)
	66	..GETRAM SIZE CREATEEXCHANGE MOV B CURRENTCS CREATETASK FREERAM LAST
843 ORCA3.CC	67	LOADDATAWRIST
139 ORCA3.CC	68	SETUPROBOTMESSAGE (6)
228 ORCA3.CC	69	COMMUNICATEWITHROBOT (8)
484 ORCA3.CC	70	LOADDATABASE (55)
394 ORCA2.CC	71	FORCEUPPER
2336 ORCA1.CC	72	RETURNTOEXEC
	73	..SENDMESSAGE
ORCA1.CC	74	ZYMATEPROGRAMMING
+ ORCA1.CC	75	DISPLAYMAINSCREEN
	76	..DISPLAY KEYBOXES
360 ORCA1.CC	77	DISPLAYBASEFUNCTIONKEYS
	78	..DISPLAY
389 ORCA1.CC	79	BASEFUNCTIONSCREEN
	80	..DISPLAY
970 ORCA3.CC	81	TELLPOSITION (34)
596 ORCA2.CC	82	UPDATELASTNAME
	83	..LAST DISPLAY FDISPLAY
409 ORCA2.CC	84	BASEFKEYS
394 ORCA2.CC	85	FORCEUPPER (71)
484 ORCA3.CC	86	LOADDATABASE (55)
434 ORCA3.CC	87	TESTZYMATEPOSITION (18)
970 ORCA3.CC	88	TELLPOSITION (34)
533 ORCA3.CC	89	MOVEZYMATE (16)
329 ORCA2.CC	90	STOPANDREINITROBOT (27)
	91	..STROBECHAR INPUT DISPLAY RECEIVEMESSAGETIMEDWAIT
484 ORCA3.CC	92	LOADDATABASE (55)
424 ORCA1.CC	93	BASECOORDINATESCREEN
212 ORCA1.CC	94	CLEARFUNCTIONAREA
	95	..DISPLAY LAST
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857 ORCA2.CC	202	—MOVEZYMATE TILLACKNOWLEDGE (189)
265 ORCA2.CC	203	—SETABSOLUTE (112)
	204	..LAST DISPLAY LOW HIGH LOOKUPEXPSYMBOL FINDSYMBOL DELETEEXPSYMBOL FDISPLAY GETCHAR TYPECHAR FINPUT SIZE STOREEXPSYMBOL CHANGEEXPSYMBOL MOV B
771 ORCA1.CC	205	—PROGRAMMINGCOMMANDSCREEN
ORCA1.CC	206	—CLEARFUNCTIONAREA (94)
ORCA2.CC	207	—BASEFKEYS (84)
717 ORCA2.CC	208	—STOREIMMEDIATECOMMAND
671 ORCA2.CC	209	—STOREANDCHECKSYMBOL (98)
	210	..DISPLAY LAST FINPUT SIZE

**C-DOC
FUNCTION COMMENT BLOCK**

Function COMMENT-BLOCK (of USERS/CALLS and LOCALS/GLOBALS)

```

- (null)
DEFIN: BYTEDATA          START: 1 ORCA1.CC
      COMMAND            COMMAND
      COMMANDMSG          COMMANDVARIABLE
      HANDGEOMETRY        IMMEDIATECOMMAND
      MODULE              MODULEDATA
      NORMALWAIT          PARM
      RACKCOMMANDENTRY    RACKINDEX
      RETURNDATA          TIMERO
      TIMER2              TIMERCMD
      VARIABLECOMMAND     VARIABLEDATA
      WORKINGRAMSIZE      ZYMATEPLACE
      ..COMMAND           ..COMMANDCODE
      ..EXCHANGEID        ..EXCHANGELINK
      ..LENGTH            ..LINK
      ..MESSAGETAIL       ..MODULEID
      ..RESPONSEID        ..TASKHEAD
      ..TYPE              A
      AH                  ANGLECOUNTS
      AXISERROR           AXISFORCE
      BASEAXIS2POS        BASEAXIS3POS
      BH                  BLINKSCLEARED
      CAL                 CALWARNING
      COL                 COMMANDCODE
      COMMANDMSGPTR       COMMANDPTR
      COMMANDTYPE         CURRENTHANDHEIGHTOFFSET
      CURRENTHANDREACHOFFSET
      EXPSYMBOLTABLEENTRY DUMMYCODE
      GRIPTOFORCEACTIVE   FKEY
      HEIGHTCOUNTS      H
      J                   HEIGHTMESSAGE
      MESSAGEPTR          LASTPOSITIONTYPE
      MONUMENTHEIGHT      MODULEWAIT
      NEURACK             MONUMENTREACH
      PARMPTR            NUMBER
      RACKCOMMANDENTRYPTR POSITIONTYPE
      RAMPTR             RACKCOMMANDPTR
      RNO                REACHCOUNTS
      RN3                RN1
      ROBOTCOMMANDCODE    RN4
      SPACES              ROBOTSTATUS
      SYRINGECOUNTS       SPEEDMUL
      VARIABLEDATAPTR     TIMEOUT
      WRISTAXIS1POS       WAITFORRETURN
      WRISTCOUNTS        WRISTAXIS2POS
      WRISTMESSAGE        WRISTMESSAGE

      ..DESTINATIONID
      ..HOMEID
      ..MESSAGEHEAD
      ..PTR
      ..TASKTAIL
      ACCESSPTR
      ANGLEMESSAGE
      BASEAXIS1POS
      BASEFORCEACTIVE
      BUFFER
      CHECKSUM
      COMMANDEXCHANGE
      COMMANDEXTABLE
      CURRENTHANDLATERALOFFSET
      ENTRYNOTFOUNDMESSAGE
      GRIPCOUNTS
      HANDGEOMETRYPTR
      INITERRORMESSAGE
      MAINMESSAGE
      MONUMENTANGLE
      MOVEMENTCOMMAND
      OUTPUTVOLTAGE
      PRESSRETMESAGE
      RACKINDEXPTR
      REACHMESSAGE
      RN2
      RN5
      ROW
      STOPKEYPRESSED
      TRIES
      WIDENUMFORMAT
      WRISTAXIS3POS
      ZPCASE

FUNCT: VIBRATORUNITS      START: 140 ORCA1.CC
USERS: MOVETOLOCATIONSCREEN INITZYMATE
CALLS: IABS
PARAM: VIBRATORSPEED
LOCAL: UNITS

FUNCT: LOADDATABASEWAIT  START: 160 ORCA1.CC
USERS: INITZYMATE
CALLS: ZYMATEWAIT
PARAM: AXIS1ACCEL        LOADDATABASE
      AXIS2ACCEL        AXIS1OFFSET
      AXIS3ACCEL        AXIS2OFFSET
                        AXIS3OFFSET
                        AXIS1SPEED
                        AXIS2SPEED
                        AXIS3SPEED

FUNCT: LOADDATAWRISTWAIT START: 175 ORCA1.CC
USERS: INITZYMATE
CALLS: ZYMATEHANDWAIT
PARAM: AXIS1ACCEL        LOADDATAWRIST
      AXIS2SPEED        AXIS1SPEED
                        AXIS2ACCEL
                        AXIS3SPEED

FUNCT: CLEARKEYBOXES     START: 189 ORCA1.CC
USERS: HANDDEFINITIONSCREEN
CALLS: DISPLAY           ZYMATEHANDPROGRAMMING
LOCAL: I                 LAST
                        SPACES

      ZYMATEPROGRAMMING

      BASESENCESCREEN
      CALIBRATIONSCREEN
      HANDCOORDINATESCREEN
      HANDDEFINITIONSCREEN

      CLEARFUNCTIONAREA
      BASECOORDINATESCREEN
      MONUMENTSCREEN
      RACKSETUPSCREEN
      HANDSPEEDSCREEN
      BASESPEEDSCREEN
      PROGRAMMINGCOMMANDSCREEN
      WRISTCALIBRATIONSCREEN
      HANDSENSESCREEN

```


	DELETECOMMANDSCREEN	ZYMATEHANDPROGRAMMING	ZYMATEPROGRAMMING
C/	DISPLAY	LAST	
G/	I	SPACES	
<hr/>			
FUNCT:	CLEARNAMEAREA	START: 223 ORCA1.CC	
USERS:	MONUMENTSCREEN		
CALLS:	DISPLAY	LAST	
GLOBL:	SPACES		
<hr/>			
FUNCT:	VALUEENTERED	START: 260 ORCA1.CC	
USERS:	DOCAL	MOVETOLOCATIONSCREEN	MOVETOCOORDINATESSCREEN
CALLS:	CURSORON	DISPLAY	GETCHAR
	CURSROFF	TYPEIN	TYPECHAR
	CURRUBOUT		
GLOBL:	BUFFER	CHAR	I
PARAM:	BUFFERWIDTH	COL	ROW
<hr/>			
FUNCT:	DISPLAYMAINSRCEEN	START: 332 ORCA1.CC	
USERS:	ZYMATEPROGRAMMING		
CALLS:	DISPLAY	KEYBOXES	
GLOBL:	I	MAINMESSAGE	
<hr/>			
FUNCT:	DISPLAYBASEFUNCTIONKEYS	START: 358 ORCA1.CC	
USERS:	HANDDEFINITIONSCREEN	ZYMATEPROGRAMMING	
CALLS:	DISPLAY		
<hr/>			
FUNCT:	DISPLAYHANDFUNCTIONKEYS	START: 373 ORCA1.CC	
USERS:	HANDDEFINITIONSCREEN	ZYMATEHANDPROGRAMMING	
CALLS:	DISPLAY		
<hr/>			
FUNCT:	BASEFUNCTIONSCREEN	START: 387 ORCA1.CC	
USERS:	ZYMATEPROGRAMMING		
CALLS:	DISPLAY		
<hr/>			
FUNCT:	HANDFUNCTIONSCREEN	START: 406 ORCA1.CC	
U/	ZYMATEHANDPROGRAMMING		
C/	DISPLAY		
<hr/>			
FUNCT:	BASECOORDINATESCREEN	START: 422 ORCA1.CC	
USERS:	ZYMATEPROGRAMMING		
CALLS:	CLEARFUNCTIONAREA	DISPLAY	LAST
	BASEFKEYS	SIZE	FINDB
	STORECOMMANDVARIABLE		
GLOBL:	CHAR	ZPCASE	
LOCAL:	ZPKEYS		
<hr/>			
FUNCT:	BASESPEEDSCREEN	START: 460 ORCA1.CC	
USERS:	ZYMATEPROGRAMMING		
CALLS:	CLEARFUNCTIONAREA	DISPLAY	LAST
	BASEFKEYS	FINDB	SIZE
	STORECOMMANDVARIABLE		
GLOBL:	CHAR	ZPCASE	
LOCAL:	ZPKEYS		
<hr/>			
FUNCT:	BASESENSESCREEN	START: 502 ORCA1.CC	
USERS:	ZYMATEPROGRAMMING		
CALLS:	CLEARFUNCTIONAREA	DISPLAY	LAST
	BASEFKEYS	SIZE	FINDB
	GETBASEFORCEVALUES	DISPLAYBASEFORCES	STORECOMMANDVARIABLE
GLOBL:	CHAR	ZPCASE	
LOCAL:	ZPKEYS		
<hr/>			
FUNCT:	MONUMENTSCREEN	START: 545 ORCA1.CC	
USERS:	ZYMATEPROGRAMMING		
CALLS:	CLEARFUNCTIONAREA	CLEARNAMEAREA	UPDTELASTNAME
	LAST	DISPLAY	LOW
	HIGH	LOOKUPEXPSYMBOL	FINDSYMBOL
	DELETEEXPSYMBOL	FDISPLAY	FORCEUPPER
	GETCHAR	TYPECHAR	MOVEZYMATEIILLACKNOWLEDGE
	FINPUT	SIZE	STOREEXPSYMBOL
	CHANGEEXPSYMBOL	MOVB	SETABSOLUTE
	COMMAND	COMMANDENTRY	
	ABBREV	CHAR	COMMANDCODE
	COMMANDPTR	DUMMYPTR	FORMAT
	G	LENGTH	MODULEID
	MYMODULEID	NAME	NAMEFORMAT
	NAMELENGTH	RAMPTR	RESPONSE
	SPACES	TYPE	

LOCAL: NEWMONUMENT	NEWNAME	
F: PROGRAMMINGCOMMANDSCREEN	START: 719 ORCA1.CC	
L: ZYMATEPROGRAMMING		
CALLS: CLEARFUNCTIONAREA	DISPLAY	LAST
BASEFKEYS	FINDB	SIZE
STOREIMMEDIATECOMMAND		
GLOBL: CHAR	ZPCASE	
LOCAL: ZPKEYS		
FUNCT: DOCAL	START: 765 ORCA1.CC	
USERS: CALIBRATIONSCREEN	WRISTCALIBRATIONSCREEN	
CALLS: STROBECHAR	VALUEENTERED	ASCII TO REAL
FIX	UNSIGN	DOUBLE
LOW	DDIV	DMUL
SIGNED	DISPLAY	
GLOBL: BUFFER	CAL	CAL FACTOR
CALWARNING	CHAR	NUMBER
PENDINGVALUE	RN1	
PARAM: AXISCALFACTORPTR	AXISPOSPTR	CAL 10 PERCENT
COL	FORMATPTR	ROW
LOCAL: TEMPCALFACTOR		
FUNCT: DOBASEZEROS	START: 833 ORCA1.CC	
USERS: CALIBRATIONSCREEN		
CALLS: STROBECHAR	FORCEUPPER	INPUT
MOVEZYMATE	RECEIVEMESSAGETIMEDWAIT	
GLOBL: CAL	CALFACTOR.ANGLEZERO	CALFACTOR.HEIGHTZERO
CALFACTOR.REACHZERO	DUMMYPTR	
LOCAL: CHAR	FKEY	
FUNCT: DOWRISTZEROS	START: 900 ORCA1.CC	
USERS: WRISTCALIBRATIONSCREEN		
CALLS: STROBECHAR	FORCEUPPER	INPUT
MOVEHAND	RECEIVEMESSAGETIMEDWAIT	
GLOBL: CAL	CALFACTOR.GRIPZERO	CALFACTOR.SYRINGEZERO
CALFACTOR.WRISTZERO	DUMMYPTR	
: CHAR	FKEY	
FUNCT: CALIBRATIONSCREEN	START: 957 ORCA1.CC	
USERS: ZYMATEPROGRAMMING		
CALLS: CLEARFUNCTIONAREA	DISPLAY	STROBECHAR
FORCEUPPER	DOCAL	LAST
DOBASEZEROS	FDISPLAY	SETUPROBOTMESSAGE
COMMUNICATEWITHROBOT	SETFACTORYCAL	SAVECALIBRATIONDATA
MOVEZYMATE	TELLPOSITION	
GLOBL: ACCESSPTR	C	CAL
CALFACTOR.ANGLE	CALFACTOR.ANGLEZERO	CALFACTOR.HEIGHT
CALFACTOR.HEIGHTZERO	CALFACTOR.REACH	CALFACTOR.REACHZERO
CHAR	F	FIRSTDISPLAY
PENDINGHEIGHT	PENDINGREACH	ROBOTMESSAGE
SPACES	TEXT	WIDENUMFORMAT
WORDDATA	Z	
FUNCT: WRISTCALIBRATIONSCREEN	START: 1062 ORCA1.CC	
USERS: ZYMATEHANDPROGRAMMING		
CALLS: CLEARFUNCTIONAREA	DISPLAY	FORCEUPPER
STROBECHAR	DOCAL	LAST
DOWRISTZEROS	FDISPLAY	SETUPROBOTMESSAGE
COMMUNICATEWITHROBOT	SETFACTORYCAL	SAVECALIBRATIONDATA
MOVEHAND	TELLPOSITION	
GLOBL: ACCESSPTR	C	CAL
CALFACTOR.GRIP	CALFACTOR.GRIPZERO	CALFACTOR.SYRINGE
CALFACTOR.SYRINGEZERO	CALFACTOR.WRIST	CALFACTOR.WRISTZERO
CHAR	F	PENDINGGRIP
PENDINGSYRINGE	PENDINGWRIST	ROBOTMESSAGE
SPACES	TEXT	WIDENUMFORMAT
WORDDATA	Z	
FUNCT: HANDCOORDINATESCREEN	START: 1152 ORCA1.CC	
US: ZYMATEHANDPROGRAMMING		
CLEARFUNCTIONAREA	DISPLAY	LAST
HANDFKEYS	SIZE	FINDB
STORECOMMANDVARIABLE		
GLOBL: CHAR	ZPCASE	
LOCAL: ZPKEYS		
FUNCT: HANDSPEEDSCREEN	START: 1190 ORCA1.CC	

C-DOC

USERS: ZYMATEHANDPROGRAMMING
 C CLEARFUNCTIONAREA
 HANDKEYS
 STORECOMMANDVARIABLE
 GLOBL: CHAR
 LOCAL: ZPKEYS

DISPLAY
 SIZE
 ZPCASE

LAST
 FINDB

FUNCT: HANDSENSESCREEN
 USERS: ZYMATEHANDPROGRAMMING
 CALLS: CLEARFUNCTIONAREA
 HANDKEYS
 GETWRISTFORCEVALUES
 GLOBL: CHAR
 LOCAL: ZPKEYS

START: 1232 ORCA1.CC
 DISPLAY
 FINDB
 DISPLAYCURRENTGRIPFORCE
 ZPCASE

LAST
 SIZE
 STORECOMMANDVARIABLE

FUNCT: HANDDEFINITIONSCREEN
 USERS: ZYMATEHANDPROGRAMMING
 CALLS: CLEARFUNCTIONAREA
 LOOKUPEXPSYMBOL
 SAL
 CLEARKEYBOXES
 MOVEZYMATEILLACKNOWLEDGE
 COS
 GETDICTIONARYHANDOFFSETS
 CHANGEEXPSYMBOL
 DEFIN: COMMAND
 GLOBL: ABBREV
 CHAR
 CURRENTHANDNAME
 HANDGEOMETRYPTR
 LATERALOFFSET
 MONUMENTANGLE
 MYMODULEID
 RAMPTR
 RESPONSE
 L : NEWHAND

START: 1273 ORCA1.CC
 LOW
 DISPLAY
 FINPUT
 DISPLAYBASEFUNCTIONKEYS
 DISPLAYHANDFUNCTIONKEYS
 FIX
 SIZE
 DISPLAYCURRENTHAND
 COMMANDENTRY
 ANGLE
 COMMANDCODE
 FORMAT
 HEIGHT
 LENGTH
 MONUMENTHEIGHT
 NAME
 REACH
 SPACES

HIGH
 MOVB
 MOVEHANDTILLACKNOWLEDGE
 LAST
 FLOAT
 SIN
 STOREEXPSYMBOL
 HANDGEOMETRY
 BASEPAGE
 COMMANDPTR
 G
 HEIGHTOFFSET
 MODULEID
 MONUMENTREACH
 NAMELENGTH
 REACHOFFSET
 TYPE

T: INPUTANDMOVETORACKINDEX
 CALLS: MOVETOLOCATIONSCREEN
 DISPLAYCURRENTHAND
 MOVETORACKINDEX
 GLOBL: ABORT
 NUMBER
 PENDINGREACH
 REFHEIGHT

START: 1404 ORCA1.CC
 DISPLAY
 COMMANDPTR
 PENDINGANGLE
 RACKCOMMANDPTR
 REFREACH

FINPUT
 CURRENTNAMETYPE
 PENDINGHEIGHT
 REFANGLE

FUNCT: GETSCALEDATA
 USERS: MOVETOLOCATIONSCREEN
 CALLS: FIX
 GLOBL: RN1
 PARAM: SCALEFACTOR

START: 1431 ORCA1.CC

FUNCT: RANGECHECKVALUE
 USERS: MOVETOLOCATIONSCREEN
 GLOBL: RN1
 PARAM: HIGH

START: 1438 ORCA1.CC
 LOW

FUNCT: MOVETOLOCATIONSCREEN
 USERS: ZYMATEHANDPROGRAMMING
 CALLS: UPDATELASTNAME
 FINPUT
 VALUEENTERED
 COMPUTERELATIVE
 RANGECHECKVALUE
 COMMUNICATEWITHROBOT
 VIBRATORUNITS
 LOADDATABASE
 SAL
 MOVEZYMATE
 REALTOASCII
 DF : COMMAND
 ABSOLUTESIGN
 AXISFORCE
 COMMANDPTR
 CURRENTNAMETYPE
 FIRSTDISPLAY
 GRIPTOFORCEVALUE
 HEIGHT

START: 1457 ORCA1.CC
 ZYMATEPROGRAMMING
 LAST
 MOVB
 ASCII TOREAL
 COMPUTEHAND
 GETSCALEDATA
 ZYMATEHANDWAIT
 FLOAT
 LOADDATAWRIST
 DISPLAYCURRENTHAND
 MOVEHAND
 NUMOUT
 COMMANDENTRY
 ANGLE
 BUFFER
 CURRENTHANDNAME
 DIRECTPATH
 GRIPACCEL
 HANDGEOMETRYPTR
 HEIGHTSPEED

DISPLAY
 FINDSYMBOL
 COMPUTEABSOLUTE
 INPUTANDMOVETORACKINDEX
 SETUPROBOTMESSAGE
 FIX
 UNSIGN
 LOOKUPEXPSYMBOL
 GETDICTIONARYHANDOFFSETS
 TELLPOSITION
 FDISPLAY
 ZYMATEPLACE
 ANGLESPEED
 COMMANDCODE
 CURRENTNAME
 ENTRYNOTFOUNDMESSAGE
 GRIPSPEED
 HANDSIGN
 I

MODULEID NAME NUMBER PENDINGGRIP PENDINGSYRINGE RAMPTR REACHSPEED REFHEIGHT RESPONSE ROBOTSPEED SETABSWARNING SYRINGESPEED VERTICALACCEL WRISTACCEL	MOVEMENTCOMMAND NAMEFORMAT OUTPUTVOLTAGE PENDINGHEIGHT PENDINGWRIST REACH REACHTRANSOFFSET REFREACH RN1 ROTARYACCEL SPACES TEXT VERTICALTRANSOFFSET WRISTSPEED DICSYMPTR	MYMODULEID NAMELENGTH PENDINGANGLE PENDINGREACH POSITIONTYPE REACHACCEL REFANGLE RELATIVESIGN ROBOTMESSAGE ROTARYTRANSOFFSET SYRINGEACCEL TYPE VIBRATORSPEED
LOCAL: CODE		INT
FUNCT: RESTOREPOSITION USERS: MOVETOCOORDINATESSCREEN CALLS: TELLPOSITION GLOBL: ANGLE HEIGHT PENDINGHEIGHT PENDINGWRIST WRIST	START: 1855 ORCA1.CC ZYMATEPROGRAMMING FIRSTDISPLAY PENDINGANGLE PENDINGREACH REACH	GRIP PENDINGGRIP PENDINGSYRINGE SYRINGE
FUNCT: GETSCALEDNR1 USERS: MOVETOCOORDINATESSCREEN CALLS: ASCIIITOREAL GLOBL: BUFFER PARAM: MAX	START: 1868 ORCA1.CC FLOAT RN1 MIN	FIX SCALEFACTOR
FUNCT: MOVETOCOORDINATESSCREEN USERS: ZYMATEHANDPROGRAMMING CALLS: UPDATELASTNAME GETSCALEDNR1 DISPLAY G. BUFFER PENDINGANGLE PENDINGREACH	START: 1890 ORCA1.CC ZYMATEPROGRAMMING VALUEENTERED MOVEZYMA TELLPOSITION FIRSTDISPLAY PENDINGGRIP PENDINGSYRINGE	RESTOREPOSITION MOVEHAND I PENDINGHEIGHT PENDINGWRIST
FUNCT: CHANGELOCATIONSCREEN USERS: ZYMATEHANDPROGRAMMING CALLS: UPDATELASTNAME DISPLAY SETHAND DEFIN: COMMAND GLOBL: ABSOLUTESIGN ENTRYNOTFOUNDMESSAGE MYMODULEID NAMELENGTH RESPONSE	START: 1958 ORCA1.CC ZYMATEPROGRAMMING FINPUT SETABSOLUTE CHANGEEXPSYMBOL COMMANDENTRY COMMANDCODE HANDSIGN NAME RAMPTR TYPE	LOOKUPEXPSYMBOL SETRELATIVE TYPEN COMMANDPTR MODULEID NAMEFORMAT RELATIVESIGN
FUNCT: DELETECOMMANDSCREEN USERS: ZYMATEHANDPROGRAMMING CALLS: CLEARFUNCTIONAREA LOOKUPEXPSYMBOL DEFIN: COMMAND GLOBL: COMMANDPTR MYMODULEID NAMELENGTH	START: 2011 ORCA1.CC ZYMATEPROGRAMMING DISPLAY DELETEEXPSYMBOL COMMANDENTRY ENTRYNOTFOUNDMESSAGE NAME RAMPTR	FINPUT MODULEID NAMEFORMAT RESPONSE
FUNCT: ZYMATEHANDPROGRAMMING USERS: ZYMATEPROGRAMMING CALLS: DISPLAY CLEARFUNCTIONAREA LAST FINDB HANDSPEEDSCREEN STOREROBOTPOSITION CHANGELOCATIONSCREEN TYPEN RECEIVEMESSAGETIMEDWAIT BASEPAGE FIRSTDISPLAY PRESSRETMESAGE SYRINGESPEED WRISTSPEED LOCAL: ZPKEYS	START: 2052 ORCA1.CC CLEARKEYBOXES HANDFUNCTIONSCREEN HANDFKEYS LOADDATAWRIST HANDSENSESCREEN MOVETOLOCATIONSCREEN DELETECOMMANDSCREEN STROBECHAR CHAR GRIPACCEL SPACES WAITFORRETURN ZPCASE	DISPLAYHANDFUNCTIONKEYS TELLPOSITION SIZE HANDCOORDINATESSCREEN HANDDEFINITIONSCREEN MOVETOCOORDINATESSCREEN WRISTCALIBRATIONSCREEN FORCEUPPER DUMMYPTR GRIPSPEED SYRINGEACCEL WRISTACCEL

FUNCTION	DESCRIPTION	START	END	ORCA1.CC
GLOBAL	ZYMATEPROGRAMMING INITZYMATE CLEARSCREEN BASEFUNCTIONSCREEN LAST FINDB BASECOORDINATESCREEN STOREROBOTPOSITION MOVETOCOORDINATESSCREEN MONUMENTSCREEN CALIBRATIONSCREEN CLEARKEYBOXES FORCEUPPER ANGLESPEED DUMMYPTR MAINMESSAGE REACHSPEED ROTARYTRANSOFFSET VERTICALTRANSOFFSET	2283	2303	ORCA1.CC
LOCAL	ZPKEYS			
GLOBAL	RANGECHECKSPEEDIN USERS: INITZYMATE CALLS: FLOAT UNSIGN DEFIN: VARIABLECOMMAND GLOBL: VALUE PARAM: MAXSPEED	2320	2344	ORCA1.CC
GLOBAL	TESTNEWFORPENDING USERS: INITZYMATE DEFIN: VARIABLECOMMAND GLOBL: MOVEMENTCOMMAND	2344	2344	ORCA1.CC
GLOBAL	RETURNTOEXEC USERS: INITZYMATE CALLS: SENDMESSAGE DEFIN: COMMAND GLOBL: ABORT RESPONSEID	2344	2344	ORCA1.CC
GLOBAL	INITZYMATE CALLS: GETRAM HIGH STOREEXPSYMBOL CHANGEEXPSYMBOL LOADDATAWRIST SHR FORCEUPPER ZYMATEPROGRAMMING COMPUTEHAND RANGECHECKPOSITION DIVRND GETPOSITION RECEIVEMESSAGETIMEDWAIT RANGECHECKSPEEDIN LOADDATAWRISTWAIT LOOKUPEXPSYMBOL MOVEZYMATE DEFIN: COMMAND HANDGEOMETRY MODULEDATA VARIABLECOMMAND GLOBL: ABBREV ANGLE ANGLESPEED CHAR COMMANDEXCHANGE.EXCHANGEID COMMANDPTR CURRENTHANDNAME EXCHANGEID GRIP	2344	2344	ORCA1.CC
GLOBAL	ABORT ANGLEFORCE AXISFORCE COMMANDCODE COMMANDMODE COMMANDTABLE DIRECTPATH FORMAT GRIPACCEL	2344	2344	ORCA1.CC
GLOBAL	LOW MOV8 TYPECRLF INITZYMATEROBOT RECEIVEMESSAGE CLEARSCREEN RETURNTOEXEC COMPUTERELATIVE TESTNEWFORPENDING FLOAT COMMUNICATEWITHROBOT ZYMATEHANDWAIT VIBRATORUNITS SIGNED GETBASEFORCEVALUES GETDICTIONARYHANDOFFSETS	2344	2344	ORCA1.CC
GLOBAL	ACCESSPTR ANGLEMESSAGE BASEFORCEACTIVE COMMANDEXCHANGE COMMANDMSGPTR COMMANDTYPE DUMMYPTR FORMATCODE GRIPFORCE	2344	2344	ORCA1.CC

GRIPSPEED	GRIPTOFORCEACTIVE	GRIPTOFORCEVALUE
HANDGEOMETRYPTR	HEIGHT	HEIGHTFORCE
HEIGHTMESSAGE	HEIGHTSPEED	I
INITERRORMESSAGE	KEYPADSTATUS	LASTPOSITIONTYPE
LENGTH	MODULEID	MODULEWAIT
MOVEMENTCOMMAND	MOVING	MYMODULEID
NAME	NAMELENGTH	OUTPUTVOLTAGE
PARMPTR	PENDINGANGLE	PENDINGGRIP
PENDINGHEIGHT	PENDINGREACH	PENDINGSYRINGE
PENDINGWRIST	POSITIONTYPE	PRESSRETMESAGE
PTR	PTRTOPARMS	RAMPTR
REACH	REACHACCEL	REACHFORCE
REACHMESSAGE	REACHSPEED	REACHTRANSOFFSET
REFANGLE	REFHEIGHT	REFREACH
RESPONSE	ROBOTMESSAGE	ROBOTSPEED
ROTARYACCEL	ROTARYTRANSOFFSET	SETABSWARNING
SETUPCOMMAND	SYRINGEACCEL	SYRINGESPEED
TEXT	TYPE	VALUE
VERTICALACCEL	VERTICALTRANSOFFSET	VIBRATORSPEED
WRISTACCEL	WRISTMESSAGE	WRISTSPEED
WRISTSTATUS		
PARAM: ZYMATEID		
LOCAL: ANGLEFAULT	HEIGHTFAULT	INITFAULT
REACHFAULT	SYRINGEFAULT	WRISTFAULT

FUNCT: GETPOSITION	START: 79 ORCA2.CC	
USERS: STOPANDREINITROBOT	INITZYMATEROBOT	INITZYMATE
CALLS: SETUPROBOTMESSAGE	COMMUNICATEWITHROBOT	DDIV
DOUBLE	DMUL	LOW
SIGNED		
GLOBL: A	ANGLE	B
C	CALFACTOR.ANGLE	CALFACTOR.ANGLEZERO
CALFACTOR.GRIP	CALFACTOR.GRIPZERO	CALFACTOR.HEIGHT
CALFACTOR.HEIGHTZERO	CALFACTOR.REACH	CALFACTOR.REACHZERO
CALFACTOR.SYRINGE	CALFACTOR.SYRINGEZERO	CALFACTOR.WRIST
CALFACTOR.WRISTZERO	GRIP	HEIGHT
PENDINGGRIP	PENDINGSYRINGE	REACH
ROBOTMESSAGE	SYRINGE	TEMP
TEXT	WRIST	
PARAM: PORTADDRESS		
LOCAL: ..A	..B	..C
ROBOTCOMMANDCODE	TEMPPTR	

FUNCT: DISPLAYCOLLISIONMESSAGE	START: 203 ORCA2.CC	
USERS: STOPANDREINITROBOT		
CALLS: DISPLAY	TYPEN	SHR
GLOBL: BASESTATUS	COMMANDMODE	WRISTSTATUS
PARAM: AXISID		
LOCAL: NOTINPOSMMSG		

FUNCT: SETABSOLUTE	START: 263 ORCA2.CC	
USERS: MONUMENTSCREEN	STOREROBOTPOSITION	CHANGELOCATIONSCREEN
CALLS: SAR		
DEFIN: COMMAND		
GLOBL: ANGLE	HEIGHT	REACH
REFANGLE	REFHEIGHT	REFREACH

FUNCT: SETRELATIVE	START: 274 ORCA2.CC	
USERS: STOREROBOTPOSITION	CHANGELOCATIONSCREEN	
CALLS: SAR		
DEFIN: COMMAND		
GLOBL: ANGLE	HEIGHT	REACH
REFANGLE	REFHEIGHT	REFREACH

FUNCT: SETHAND	START: 282 ORCA2.CC	
USERS: STOREROBOTPOSITION	CHANGELOCATIONSCREEN	
CALLS: SAR		
DEFIN: HANDCOMMAND		
GLOBL: GRIP	SYRINGE	WRIST

FUNCT: COMPUTEABSOLUTE	START: 290 ORCA2.CC	
MOVETOLOCATIONSCREEN	INITZYMATE	
CALLS: SAL		
DEFIN: COMMAND		
GLOBL: ANGLE	HEIGHT	PENDINGANGLE
PENDINGHEIGHT	PENDINGREACH	REACH
REFANGLE	REFHEIGHT	REFREACH

FUNCT: COMPUTERELATIVE U : MOVETOLOCATIONSCREEN C : SAL I: COMMAND	START: 298 ORCA2.CC INITZYMATE	
GLOBL: ANGLE PENDINGHEIGHT REFANGLE	HEIGHT PENDINGREACH REFHEIGHT	PENDINGANGLE REACH REFREACH

FUNCT: COMPUTEHAND USERS: MOVETOLOCATIONSCREEN CALLS: SAL DEFIN: HANDCOMMAND	START: 306 ORCA2.CC INITZYMATE	
GLOBL: GRIP PENDINGWRIST	PENDINGGRIP SYRINGE	PENDINGSYRINGE WRIST

FUNCT: STOPANDREINITROBOT USERS: ZYMATEWAIT ZYMAHANDWAIT	START: 327 ORCA2.CC BASEFKEYS	HANDFKEYS
CALLS: TYPEN TYPECRLF TELLPOSITION STROBEKEYPAD	DISPLAY RELEASE MOVEZYMATE LAST	DISPLAYCOLLISIONMESSAGE GETPOSITION MOVEHAND
GLOBL: ABORT CHAR HEIGHT MOVING PENDINGHEIGHT REACH STOPPEDMESSAGE	ANGLE COMMANDMODE KEYMESSAGE MYMODULEID PENDINGREACH SPACES WRIST	BASESTATUS FIRSTDISPLAY KEYPADSTATUS PENDINGANGLE PENDINGWRIST STOPKEYPRESSED WRISTSTATUS
PARAM: AXISID		

FUNCT: FORCEUPPER USERS: BASEFKEYS DOBASEZEROS RACKSETUPSCREEN ZYMAHANDPROGRAMMING	START: 392 ORCA2.CC HANDFKEYS DOWRISTZEROS WRISTCALIBRATIONSCREEN INITZYMATE	MONUMENTSCREEN CALIBRATIONSCREEN ZYMAHANDPROGRAMMING
P : CHAR		

FUNCT: BASEFKEYS USERS: BASECOORDINATESCREEN PROGRAMMINGCOMMANDSCREEN	START: 407 ORCA2.CC BASESPEEDSCREEN MOVEZYMATETILLACKNOWLEDGE STROBECHAR TESTZYMAPOSITION MOVEZYMATE	BASESENSESCREEN ZYMAHANDPROGRAMMING INPUT DISPLAY RECEIVEMESSAGETIMEDWAIT
CALLS: FORCEUPPER LOADDATABASE TELLPOSITION STOPANDREINITROBOT		
GLOBL: BASEPAGE CHAR I PENDINGANGLE REACHACCEL ROTARYTRANSOFFSET VERTICALTRANSOFFSET	BASESTATUS DUMMYPTR KEYPADSTATUS PENDINGHEIGHT REACHTRANSOFFSET SPEEDMUL	BLINKSCLEARED FKEY MOVING PENDINGREACH ROTARYACCEL VERTICALACCEL

FUNCT: HANDFKEYS USERS: MOVEHANDTILLACKNOWLEDGE HANDSENSESCREEN	START: 508 ORCA2.CC HANDCOORDINATESCREEN ZYMAHANDPROGRAMMING FORCEUPPER TESTHANDPOSITION MOVEHAND	HANDSPEEDSCREEN INPUT DISPLAY RECEIVEMESSAGETIMEDWAIT
CALLS: STROBECHAR LOADDATAWRIST TELLPOSITION STOPANDREINITROBOT		
GLOBL: BASEPAGE CHAR GRIPACCEL MOVING PENDINGWRIST WRISTACCEL	BASESTATUS DUMMYPTR I PENDINGGRIP SPEEDMUL	BLINKSCLEARED FKEY KEYPADSTATUS PENDINGSYRINGE SYRINGEACCEL

FUNCT: UPDATALASTNAME USERS: MONUMENTSCREEN MOVETOLOCATIONSCREEN ZYMAHANDPROGRAMMING	START: 594 ORCA2.CC STOREROBOTPOSITION MOVETOCOORDINATESCREEN	RACKSETUPSCREEN CHANGELocationSCREEN
CALLS: LAST CURRENTNAME SPACES	DISPLAY CURRENTNAMETYPE	FDISPLAY I

FUNCT: DISPLAYCURRENTGRIPFORCE USERS: HANDSENSESCREEN CALLS: DISPLAY	START: 613 ORCA2.CC UNSIGN	IABS

DISPLAYNUMBER
G: GRIPFORCE
I: NUM

FUNCT: DISPLAYBASEFORCES START: 630 ORCA2.CC
USERS: BASESENSESCREEN
CALLS: DISPLAY IABS UNSIGN
DISPLAYNUMBER
GLOBL: ANGLEFORCE HEIGHTFORCE REACHFORCE
LOCAL: NUM

FUNCT: STOREANDCHECKSYMBOL START: 669 ORCA2.CC
USERS: STORECOMMANDVARIABLE STOREIMMEDIATECOMMAND STOREROBOTPOSITION
CALLS: MOVW STOREEXPSYMBOL DISPLAY
DEFIN: COMMANDENTRY
GLOBL: CURRENTNAME NAMELENGTH RAMPTR
RESPONSE

FUNCT: STORECOMMANDVARIABLE START: 693 ORCA2.CC
USERS: BASECOORDINATESCREEN BASESPEEDSCREEN BASESENSESCREEN
HANDCOORDINATESCREEN HANDSPEEDSCREEN HANDSENSESCREEN
CALLS: DISPLAY LAST FINPUT
SIZE STOREANDCHECKSYMBOL
DEFIN: COMMANDVARIABLE VARIABLEDATA
GLOBL: ABBREV FORMAT LENGTH
MODULEID MYMODULEID NAME
NAMELENGTH SPACES TYPE
VARIABLEDATAPTR
PARAM: COL COMMANDCODE FORMATCODE
ROW

FUNCT: STOREIMMEDIATECOMMAND START: 715 ORCA2.CC
USERS: PROGRAMMINGCOMMANDSCREEN
CALLS: DISPLAY LAST FINPUT
SIZE STOREANDCHECKSYMBOL
D: COMMAND COMMANDENTRY
G: ABBREV COMMANDPTR FORMAT
LENGTH MODULEID
NAME MYMODULEID
TYPE SPACES
PARAM: COL COMMANDCODE ROW

FUNCT: STOREROBOTPOSITION START: 736 ORCA2.CC
USERS: ZYMATEHANDPROGRAMMING ZYMATEPROGRAMMING
CALLS: UPDTELASTNAME FINPUT SIZE
DISPLAY SETHAND SETABSOLUTE
SETRELATIVE STOREANDCHECKSYMBOL
DEFIN: COMMAND COMMANDENTRY
GLOBL: ABBREV ABSOLUTESIGN COMMANDPTR
FORMAT HANDSIGN LENGTH
MODULEID MYMODULEID NAME
NAMEFORMAT RELATIVESIGN
TYPE
PARAM: COMMANDCODE

FUNCT: GETCALIBRATIONDATA START: 775 ORCA2.CC
USERS: INITZYMATEROBOT
CALLS: SETUPROBOTMESSAGE COMMUNICATEWITHROBOT MOVW
GLOBL: CALFACTOR.ANGLE CALFACTOR.HEIGHT CALFACTOR.WRIST
ROBOTMESSAGE TEXT

FUNCT: SAVECALIBRATIONDATA START: 812 ORCA2.CC
USERS: CALIBRATIONSCREEN WRISTCALIBRATIONSCREEN
CALLS: SETUPROBOTMESSAGE MOVW COMMUNICATEWITHROBOT
GLOBL: CALFACTOR.HEIGHT ROBOTMESSAGE
TEXT

FUNCT: SETFACTORYCAL START: 823 ORCA2.CC
USERS: CALIBRATIONSCREEN WRISTCALIBRATIONSCREEN INITZYMATEROBOT
CALLS: MOVEZYMATE MOVEHAND
GLOBL: CALFACTOR.ANGLE CALFACTOR.ANGLEZERO CALFACTOR.GRIP
CALFACTOR.GRIPZERO CALFACTOR.HEIGHT CALFACTOR.HEIGHTZERO
CALFACTOR.REACH CALFACTOR.REACHZERO CALFACTOR.SYRINGE
CALFACTOR.SYRINGEZERO CALFACTOR.WRIST CALFACTOR.WRISTZERO
PARAM: AXISID

FUNCT: MOVEZYMATETILLACKNOWLEDGE START: 855 ORCA2.CC
USERS: MONUMENTSCREEN RACKSETUPSCREEN HANDDEFINITIONSCREEN

CALLS: BASEKEYS G' CHAR ROTARYACCEL VERTICALTRANSOFFSET	LOADDATABASE REACHACCEL ROTARYTRANSOFFSET	REACHTRANSOFFSET VERTICALACCEL

FUNCT: MOVEHANDTILLACKNOWLEDGE USERS: HANDDEFINITIONSCREEN CALLS: HANDFKEYS GLOBL: CHAR	START: 868 ORCA2.CC	

FUNCT: DISPLAYCURRENTHAND USERS: RACKSETUPSCREEN MOVETOLOCATIONSCREEN CALLS: DISPLAY GLOBL: CURRENTHANDNAME	START: 879 ORCA2.CC HANDDEFINITIONSCREEN FDISPLAY	INPUTANDMOVETORACKINDEX

FUNCT: GETDICTIONARYHANDOFFSETS USERS: RACKSETUPSCREEN INITZYMATE CALLS: SAL DEFIN: HANDGEOMETRY GLOBL: CURRENTHANDHEIGHTOFFSET HEIGHTADDON	START: 889 ORCA2.CC HANDDEFINITIONSCREEN CURRENTHANDLATERALOFFSET REACHADDON	MOVETOLOCATIONSCREEN CURRENTHANDREACHOFFSET SIDEADDON

FUNCT: MOVETORACKINDEX USERS: RACKSETUPSCREEN CALLS: FIX DISPLAY SQRT DEFIN: RACKCOMMAND GLOBL: A COMMANDMODE CURRENTHANDREACHOFFSET DYC DZR PENDINGHEIGHT RN2 RN5 Y1 PARAM: INDEX	START: 897 ORCA2.CC COMPUTERACKLOCATION TYPEN SIGNED ATAN ABORT CURRENTHANDHEIGHTOFFSET DXC DYR INDEXWARNING PENDINGREACH RN3 ROW Z1	INPUTANDMOVETORACKINDEX TYPECLRF FLOAT COS COL CURRENTHANDLATERALOFFSET DXR DZC PENDINGANGLE RN1 RN4 X1

FUNCT: RACKSETUPSCREEN USERS: ZYMATPROGRAMMING CALLS: GETRAM DISPLAYCURRENTHAND LOOKUPEXPSYMBOL LAST FDISPLAY MOVETORACKINDEX FLOAT COS SIZE FREERAM DEFIN: COMMANDENTRY RACKCOMMANDENTRY GLOBL: ABBREV COL CURRENTHANDLATERALOFFSET DXC DYR FORMAT HEIGHT MYMODULEID NAMES PENDINGANGLE RACKCOMMANDENTRYPTR REACH REFANGLE RESPONSE RN2 ROTARYTRANSOFFSET TYPE X1 LOCAL: MOVERACK	START: 989 ORCA2.CC CLEARFUNCTIONAREA DISPLAY FORCEUPPER GETDICTIONARYHANDOFFSETS LOADDATABASE TELLPOSITION SQRT SIN STOREEXPSYMBOL HANDGEOMETRY ANGLE COMMANDCODE CURRENTHANDNAME DXR DZC G LENGTH NAME NEWRACK PENDINGHEIGHT RACKCOMMANDPTR REACHACCEL REFHEIGHT RNO RN3 ROW VERTICALACCEL Y1 TEMPINT	UPDATELASTNAME FINPUT GETCHAR MOVB MOVEZYMATETILLACKNOWLEDGE MOVEZYMATE ATAN SIGNED CHANGEEXPSYMBOL RACKCOMMAND CHAR CURRENTHANDHEIGHTOFFSET CURRENTHANDREACHOFFSET DYC DZR HANDGEOMETRYPTR MODULEID NAMELENGTH NUMBER PENDINGREACH RAMPTR REACHTRANSOFFSET REFREACH RN1 ROTARYACCEL SPACES VERTICALTRANSOFFSET Z1

FUNCT: COMPUTERACKLOCATION USERS: INITZYMATE CALLS: MOVETORACKINDEX	START: 1277 ORCA2.CC GETRAM	MOVB

	LOOKUPEXPSYMBOL TYPES FREERAM RACKCOMMAND ABORT COMMANDMODE DXR DZC NAMELENGTH RACKINDEXPTR	UNSIGN TYPE RACKINDEX ACCESSPTR COMMANDPTR DYC DZR NAMES RESPONSE	FIX TYPECRLF REALDATA COL DXC DYR NAME RACKCOMMANDPTR

FUNCT:	INITZYMATEROBOT	START: 1329 ORCA2.CC	
USERS:	INITZYMATE		
CALLS:	GETRAM RESETMESSAGEAREAANDUART CREATETASK SETFACTORYCAL MOVEZYMATE ZYMATEHANDWAIT	SIZE MOVB FREERAM LAST MOVEHAND	CREATEEXCHANGE CURRENTCS GETCALIBRATIONDATA GETPOSITION ZYMATEWAIT
GLOBL:	ANGLE CURRENTHANDHEIGHTOFFSET CURRENTHANDREACHOFFSET GRIP HEIGHTSPEED MODULEID PENDINGANGLE PENDINGREACH PRIORITY REACHSPEED REFREACH RETURNEXCHANGE.EXCHANGEID ROBOTSPEED STOPEXCHANGE STOPMONITORACTIVE STOPTASKMESSAGE.DESTINATIONID STOPTASKMESSAGE.RESPONSEID SYRINGESPEED DUMMYCODE	ANGLESPEED CURRENTHANDLATERALOFFSET CURRENTNAME GRIPSPEED I MODULENAME PENDINGGRIP PENDINGSYRINGE RDIR REFANGLE RESPONSEID ROBOTMESSAGE STACKSIZE STOPEXCHANGE.EXCHANGEID STOPTASK STOPTASKMESSAGE.HOMEID STOPTASKMESSAGE.TYPE WRIST STOPTASKPTR	CODESEG CURRENTHANDNAME DATASIZE HEIGHT INITIALIP MYMODULEID PENDINGHEIGHT PENDINGWRIST REACH REFHEIGHT RETURNEXCHANGE ROBOTMESSAGEPTR STATICTASKDESCRIPTOR STOPKEYPRESSED STOPTASKMESSAGE STOPTASKMESSAGE.LENGTH SYRINGE WRISTSPEED

FUNCT:	STOPPROGRAM	START: 1403 ORCA2.CC	
CALLS:	GETRAM RECEIVEMESSAGETIMEDWAIT	SIZE SENDMESSAGE	RECEIVEMESSAGE
DEFIN:	WORDDATA		
GLOBL:	BYTESIN CHANNELPTR HOMEID MAXRXWAIT MYMODULEID STOPEXCHANGE.EXCHANGEID STOPMONITORACTIVE TEXT	BYTESOUT CONTROLIMAGE KEYPADSTATUS MAXTXWAIT POSTTERMCHARS STOPKEYPRESSED TERMCHAR1 TYPE COUNTER	CHANNELMESSAGEDESCRIPTOR DESTINATIONID LENGTH MOVING RESPONSEID STOPMESSAGE TERMCHAR2
LOCAL:	ACCESSPTR STOPMESSAGEPTR		MESSAGEPTR

FUNCT:	DIVRND	START: 68 ORCA3.CC	
USERS:	GETWRISTFORCEVALUES	INITZYMATE	
PARAM:	DIVIDEND	DIVISOR	

FUNCT:	RESETMESSAGEAREAANDUART	START: 96 ORCA3.CC	
USERS:	SENDMESSAGETILLGOODSTATUS	INITZYMATEROBOT	
CALLS:	TIME		
DEFIN:	TIMERO WORDDATA	TIMERCMD	UARTOFFSET
GLOBL:	ACCESSPTR DESTINATIONID MAXTXWAIT POSTTERMCHARS TERMCHAR2	CHANNELPTR HOMEID MYMODULEID ROBOTMESSAGE TYPE	CONTROLIMAGE MAXRXWAIT OUTPUT TERMCHAR1

FUNCT:	SETUPROBOTMESSAGE	START: 137 ORCA3.CC	
USERS:	GETPOSITION ZYMATEWAIT GETCALIBRATIONDATA GETBASEFORCEVALUES WRISTCALIBRATIONSCREEN	DOPOSITIONCONTROL LOADDATABASE SAVECALIBRATIONDATA GETWRISTFORCEVALUES MOVETOLOCATIONSCREEN	REDOPOSITIONCONTROL ZYMATEHANDWAIT LOADDATAWRIST CALIBRATIONSCREEN INITZYMATE
CALLS:	SIZE		
GLOBL:	BYTESIN ROBOTMESSAGE	BYTESOUT TEXT	LENGTH

PARAM: COMMAND	DATABYTESIN	DATABYTESOUT
F : SENDMESSAGE TILL GOOD STATUS : COMMUNICATE WITH ROBOT CALLS: SENDMESSAGE CLEAR SCREEN RELEASE GLOBL: J MYMODULEID RETURN EXCHANGE.EXCHANGEID LOCAL: GOOD	START: 150 ORCA3.CC RECEIVE MESSAGE DISPLAY KEYPAD STATUS NAME FORMAT ROBOT MESSAGE TRIES	RESET MESSAGE AREA AND UART DOUBLE MESSAGE PTR RETURN CODE
FUNCT: COMPUTE CHECKSUM USERS: COMMUNICATE WITH ROBOT GLOBL: CHECKSUM PARAM: INDEX LOCAL: I	START: 190 ORCA3.CC ROBOT MESSAGE	TEXT
FUNCT: RETURN CHECKSUM OK USERS: COMMUNICATE WITH ROBOT GLOBL: I PARAM: BUFFER INDEX LOCAL: RETURN CHECK	START: 204 ORCA3.CC ROBOT MESSAGE CHECKSUM INDEX	TEXT
FUNCT: COMMUNICATE WITH ROBOT USERS: GET POSITION ZYMAWAIT GET CALIBRATION DATA GET BASE FORCE VALUES WRIST CALIBRATION SCREEN CALLS: COMPUTE CHECKSUM GLOBL: BYTESIN KEYPAD STATUS TEXT	START: 226 ORCA3.CC DO POSITION CONTROL LOAD DATABASE SAVE CALIBRATION DATA GET WRIST FORCE VALUES MOVE TO LOCATION SCREEN SEND MESSAGE TILL GOOD STATUS BYTESOUT ROBOT MESSAGE	REDO POSITION CONTROL ZYMA HANDWAIT LOAD DATA WRIST CALIBRATION SCREEN INITZYMA RETURN CHECKSUM OK CHECKSUM ROBOT STATUS
F : STOP MONITOR U : DO POSITION CONTROL S : SEND MESSAGE L : MOVING STOP TASK MESSAGE	START: 248 ORCA3.CC INITZYMA STOP EXCHANGE.EXCHANGEID	STOP MONITOR ACTIVE
FUNCT: DO POSITION CONTROL USERS: MOVEZYMA CALLS: SETUP ROBOT MESSAGE COMMUNICATE WITH ROBOT GLOBL: BASE AXIS1 POS ROBOT COMMAND CODE WRIST AXIS1 POS PARAM: AXIS1 POS PORT ADDR	START: 259 ORCA3.CC MOVE HAND LOW STOP MONITOR BASE AXIS2 POS ROBOT MESSAGE WRIST AXIS2 POS AXIS2 POS	HIGH BASE AXIS3 POS TEXT WRIST AXIS3 POS AXIS3 POS
FUNCT: REDO POSITION CONTROL USERS: ZYMAWAIT CALLS: SETUP ROBOT MESSAGE COMMUNICATE WITH ROBOT GLOBL: BASE AXIS1 POS ROBOT COMMAND CODE WRIST AXIS1 POS	START: 306 ORCA3.CC ZYMA HANDWAIT LOW BASE AXIS2 POS ROBOT MESSAGE WRIST AXIS2 POS	HIGH BASE AXIS3 POS TEXT WRIST AXIS3 POS
FUNCT: ZYMAWAIT USERS: LOAD DATABASE WAIT INITZYMA CALLS: SETUP ROBOT MESSAGE SHR REDO POSITION CONTROL GLOBL: ABORT DUMMY PTR ROBOT MESSAGE PARAM: WAIT TYPE LOCAL: HOLD MSG	START: 328 ORCA3.CC MOVEZYMA COMMUNICATE WITH ROBOT TYPE CRLF STOP AND REINIT ROBOT AXIS ERROR MAX RX WAIT TEXT THERMAL MSG	INITZYMA ROBOT TYPE N RECEIVE MESSAGE TIME WAIT BASE STATUS MOVING
FUNCT: TESTZYMA POSITION USERS: CALCULATE BASE AXIS COUNTS GLOBL: PENDING ANGLE	START: 432 ORCA3.CC BASE KEYS PENDING HEIGHT	PENDING REACH
FUNCT: CALCULATE BASE AXIS COUNTS USERS: MOVEZYMA CALLS: TESTZYMA POSITION	START: 473 ORCA3.CC DDIV	DMUL

G:	DOUBLE ANGLECOUNTS CALFACTOR.HEIGHT CALFACTOR.REACHZERO PENDINGHEIGHT	UNSIGN CALFACTOR.ANGLE CALFACTOR.HEIGHTZERO HEIGHTCOUNTS PENDINGREACH	LOW CALFACTOR.ANGLEZERO CALFACTOR.REACH PENDINGANGLE REACHCOUNTS

FUNCT:	LOADDATABASE	START: 482 ORCA3.CC	
USERS:	LOADDATABASEWAIT MOVEZYMATETILLACKNOWLEDGE ZYMATEPROGRAMMING	BASEFKEYS RACKSETUPSCREEN INITZYMATE COMMUNICATEWITHROBOT	MOVEZYMATE MOVETOLOCATIONSSCREEN
CALLS:	SETUPROBOTMESSAGE	TEXT	
GLOBL:	ROBOTMESSAGE	ANGLESPEED	HEIGHTACCEL
PARAM:	ANGLEACCEL HEIGHTSPEED TRANSOFFSET1	REACHACCEL TRANSOFFSET2	REACHSPEED TRANSOFFSET3

FUNCT:	MOVEZYMATE	START: 531 ORCA3.CC	
USERS:	STOPANDREINITROBOT DOBASEZEROS INITZYMATEROBOT INITZYMATE	BASEFKEYS CALIBRATIONSCREEN MOVETOLOCATIONSSCREEN	SETFACTORYCAL RACKSETUPSCREEN MOVETOCOORDINATESSCREEN
CALLS:	CALCULATEBASEAXISCOUNTS ZYMAWAIT	UNSIGN LOADDATABASE ANGLECOUNTS CALFACTOR.HEIGHT HEIGHT PENDINGANGLE RDIR REACHCOUNTS ROTARYACCEL VERTICALTRANSOFFSET	IABS DOPOSITIONCONTROL ANGLESPEED CALFACTOR.REACH HEIGHTCOUNTS PENDINGHEIGHT REACH REACHSPEED ROTARYTRANSOFFSET
GLOBL:	ANGLE CALFACTOR.ANGLE DIRECTPATH HEIGHTSPEED PENDINGREACH REACHACCEL REACHTRANSOFFSET VERTICALACCEL		
PARAM:	WAITTYPE		
LOCAL:	ANGLECYCLES AXIS3SPEED DELTAREACH MOVES	AXIS1SPEED DELTAANGLE HEIGHTCYCLES REACHCYCLES	AXIS2SPEED DELTAHEIGHT LONGESTCYCLES

T:	TESTHANDPOSITION	START: 685 ORCA3.CC	
S:	HANDFKEYS	CALCULATEHANDAXISCOUNTS	
GLOBL:	PENDINGGRIP	PENDINGSYRINGE	PENDINGWRIST

FUNCT:	CALCULATEHANDAXISCOUNTS	START: 748 ORCA3.CC	
USERS:	MOVEHAND	LOW DMUL	DOUBLE UNSIGN
CALLS:	TESTHANDPOSITION DDIV IABS		
GLOBL:	CALFACTOR.GRIP CALFACTOR.SYRINGEZERO GRIPCOUNTS PENDINGWRIST	CALFACTOR.GRIPZERO CALFACTOR.WRIST PENDINGGRIP SYRINGECOUNTS	CALFACTOR.SYRINGE CALFACTOR.WRISTZERO PENDINGSYRINGE WRISTCOUNTS

FUNCT:	ZYMATEHANDWAIT	START: 765 ORCA3.CC	
USERS:	LOADDATAWRISTWAIT MOVETOLOCATIONSSCREEN	MOVEHAND INITZYMATE COMMUNICATEWITHROBOT RECEIVEMESSAGETIMEDWAIT	INITZYMATEROBOT
CALLS:	SETUPROBOTMESSAGE TYPECRLF STOPANDREINITROBOT		TYPEN REDOPOSITIONCONTROL
GLOBL:	ABORT MAXRXWAIT TEXT	AXISERROR MOVING WRISTSTATUS	DUMMYPTR ROBOTMESSAGE
LOCAL:	HOLDMSG		

FUNCT:	MOVEHAND	START: 826 ORCA3.CC	
USERS:	STOPANDREINITROBOT DOWNRISTZEROS MOVETOLOCATIONSSCREEN	HANDFKEYS WRISTCALIBRATIONSCREEN MOVETOCOORDINATESSCREEN ZYMAWAIT GRIPCOUNTS PENDINGWRIST WRIST	SETFACTORYCAL INITZYMATEROBOT INITZYMATE DOPOSITIONCONTROL PENDINGGRIP SYRINGE WRISTCOUNTS
CALLS:	CALCULATEHANDAXISCOUNTS		
GLOBL:	GRIP PENDINGSYRINGE SYRINGECOUNTS		
PARAM:	WAITTYPE		

FUNCT:	LOADDATAWRIST	START: 841 ORCA3.CC	
USERS:	LOADDATAWRISTWAIT ZYMAWAITPROGRAMMING	HANDFKEYS INITZYMATE COMMUNICATEWITHROBOT TEXT	MOVETOLOCATIONSSCREEN
CALLS:	SETUPROBOTMESSAGE		
GLOBL:	ROBOTMESSAGE		
PARAM:	GRIPACCEL	GRIPSPEED	SYRINGEACCEL

SYRINGESPEED	WRISTACCEL	WRISTSPEED
TOINTEGER GETBASEFORCEVALUES CALLS: SIGNED PARAM: BYTEIN	START: 884 ORCA3.CC GETWRISTFORCEVALUES	
FUNCT: GETBASEFORCEVALUES USERS: BASESENSESCREEN CALLS: SETUPROBOTMESSAGE GLOBL: ANGLEFORCE RDIR ROBOTMESSAGE	START: 915 ORCA3.CC INITZYMATE COMMUNICATEWITHROBOT BASESTATUS REACH TEXT	TOINTEGER HEIGHTFORCE REACHFORCE
FUNCT: GETWRISTFORCEVALUES USERS: HANDSENSESCREEN CALLS: SETUPROBOTMESSAGE DIVRND GLOBL: GRIPFORCE TEXT	START: 929 ORCA3.CC INITZYMATE COMMUNICATEWITHROBOT ROBOTMESSAGE WRISTFORCE	TOINTEGER SYRINGEFORCE WRISTSTATUS
FUNCT: TELLPOSITION USERS: STOPANDREINITROBOT CALIBRATIONSCREEN MOVETOLOCATIONSCREEN ZYMATEHANDPROGRAMMING CALLS: DISPLAY FDISPLAY GLOBL: ANGLE HEIGHT PENDINGHEIGHT PENDINGWRIST THREEDIGITFORMAT LOCAL: NUMBER	START: 968 ORCA3.CC BASEFKEYS RACKSETUPSCREEN RESTOREPOSITION ZYMATEPROGRAMMING UNSIGN IABS FIRSTDISPLAY PENDINGANGLE PENDINGREACH REACH TWODIGITFORMAT	HANDFKEYS WRISTCALIBRATIONSCREEN MOVETOCOORDINATESSCREEN SAR GRIP PENDINGGRIP PENDINGSYRINGE SYRINGE WRIST
DISPLAYNUMBER DISPLAYCURRENTGRIPFORCE DISPLAY COL BUFFER	START: 1073 ORCA3.CC DISPLAYBASEFORCES NUMBER	ROW

**C-DOC
CALLER/CALLED XREF**

Defined (Internal) Functions, Function XREF (of CALLS/USERS) (1 of 2)

: BASECOORDINATESCREEN		FILE=ORCA1.CC	
USERS: 2177 ZYMATEPROGRAMMING			
CALLS: 427 CLEARFUNCTIONAREA	429 DISPLAY	430 DISPLAY	431 DISPLAY
440 BASEFKEYS	441 SIZE	441 FINDB	446 STORECOMMANDVARIABLE
452 STORECOMMANDVARIABLE			

FUNCT: BASEFKEYS		FILE=ORCA2.CC	
USERS: 440 BASECOORDINATESCREEN	479 BASESPEEDSCREEN	523 BASESENSESCREEN	739 PROGRAMMINGCOMMANDSCREEN
CALLS: 412 FORCEUPPER	412 STROBECHAR	421 INPUT	430 LOADDATABASE
488 DISPLAY	492 TELLPOSITION	495 MOVEZYMATE	497 RECEIVEMESSAGETIMEDWAIT
505 STOPANDREINITROBOT			

FUNCT: BASEFUNCTIONSCREEN		FILE=ORCA1.CC	
USERS: 2155 ZYMATEPROGRAMMING	2179 ZYMATEPROGRAMMING	2185 ZYMATEPROGRAMMING	2197 ZYMATEPROGRAMMING
2263 ZYMATEPROGRAMMING			
CALLS: 392 DISPLAY	393 DISPLAY	394 DISPLAY	395 DISPLAY
398 DISPLAY	399 DISPLAY	400 DISPLAY	401 DISPLAY
403 DISPLAY	404 DISPLAY		

FUNCT: BASESENSESCREEN		FILE=ORCA1.CC	
USERS: 2195 ZYMATEPROGRAMMING			
CALLS: 507 CLEARFUNCTIONAREA	509 DISPLAY	510 DISPLAY	511 DISPLAY
514 DISPLAY	515 DISPLAY	518 LAST	523 BASEFKEYS
524 FINDB	525 GETBASEFORCEVALUES	526 DISPLAYBASEFORCES	531 STORECOMMANDVARIABLE
537 STORECOMMANDVARIABLE			

FUNCT: BASESPEEDSCREEN		FILE=ORCA1.CC	
USERS: 2183 ZYMATEPROGRAMMING			
CALLS: 465 CLEARFUNCTIONAREA	467 DISPLAY	468 DISPLAY	469 DISPLAY
474 LAST	479 BASEFKEYS	480 FINDB	480 SIZE
488 STORECOMMANDVARIABLE	491 STORECOMMANDVARIABLE	494 STORECOMMANDVARIABLE	

: CALCULATEBASEAXISCOUNTS		FILE=ORCA3.CC	
USERS: 559 MOVEZYMATE			
CALLS: 477 TESTZYMATEPOSITION	478 DDIV	478 DMUL	478 DOUBLE
478 LOW	479 DOUBLE	479 DMUL	479 LOW
479 DOUBLE	479 DDIV	480 DDIV	480 DMUL
480 UNSIGN	480 DOUBLE	480 LOW	

FUNCT: CALCULATEHANDAXISCOUNTS		FILE=ORCA3.CC	
USERS: 831 MOVEHAND			
CALLS: 752 TESTHANDPOSITION	755 LOW	755 DOUBLE	755 DDIV
755 DOUBLE	759 LOW	759 UNSIGN	759 DMUL
759 DOUBLE	759 IABS	759 DOUBLE	762 DDIV
762 DOUBLE	762 DOUBLE	762 UNSIGN	762 LOW
763 DOUBLE	763 DDIV	763 DOUBLE	763 DMUL

FUNCT: CALIBRATIONSCREEN		FILE=ORCA1.CC	
USERS: 2228 ZYMATEPROGRAMMING			
CALLS: 962 CLEARFUNCTIONAREA	964 DISPLAY	965 DISPLAY	966 DISPLAY
971 FORCEUPPER	979 DOCAL	980 LAST	980 DISPLAY
982 DISPLAY	982 LAST	992 CLEARFUNCTIONAREA	994 DISPLAY
996 DISPLAY	997 DOBASEZEROS	1005 CLEARFUNCTIONAREA	1006 DISPLAY
1008 FDISPLAY	1009 FDISPLAY	1010 FDISPLAY	1011 FDISPLAY
1013 FDISPLAY	1014 SETUPROBOTMESSAGE	1015 COMMUNICATEWITHROBOT	1018 SETUPROBOTMESSAGE
1021 DISPLAY	1022 FDISPLAY	1023 FDISPLAY	1024 FDISPLAY
1026 FDISPLAY	1027 FDISPLAY	1032 SETFACTORYCAL	1033 SAVECALIBRATIONDATA
1044 DISPLAY	1046 MOVEZYMATE	1049 TELLPOSITION	

FUNCT: CHANGELOCATIONSCREEN		FILE=ORCA1.CC	
USERS: 2111 ZYMATEHANDPROGRAMMING	2207 ZYMATEPROGRAMMING		
CALLS: 1962 UPDATALASTNAME	1963 FINPUT	1968 LOOKUPEXPSYMBOL	1974 DISPLAY
1984 DISPLAY	1985 SETRELATIVE	1988 DISPLAY	1989 SETHAND
1993 DISPLAY	1996 TYPEN	2000 TYPEN	2001 DISPLAY

FUNCT: CLEARFUNCTIONAREA		FILE=ORCA1.CC	
USERS: 427 BASECOORDINATESCREEN	465 BASESPEEDSCREEN	507 BASESENSESCREEN	551 MONUMENTSCREEN
992 CALIBRATIONSCREEN	996 RACKSETUPSCREEN	1005 CALIBRATIONSCREEN	1067 WRISTCALIBRATIONSCREEN
1108 WRISTCALIBRATIONSCREEN	1157 HANDCOORDINATESCREEN	1195 HANDSPEEDSCREEN	1237 HANDSENSESCREEN
2015 DELETECOMMANDSCREEN	2060 ZYMATEHANDPROGRAMMING	2081 ZYMATEHANDPROGRAMMING	2087 ZYMATEHANDPROGRAMMING
2139 ZYMATEHANDPROGRAMMING	2178 ZYMATEPROGRAMMING	2184 ZYMATEPROGRAMMING	2196 ZYMATEPROGRAMMING
2244 ZYMATEPROGRAMMING	2262 ZYMATEPROGRAMMING		
CALLS: 216 DISPLAY	216 LAST	220 LAST	220 DISPLAY

FUNCT: CLEARKEYBOXES		FILE=ORCA1.CC		
U' :	1348 HANDDEFINITIONSCREEN	1354 HANDDEFINITIONSCREEN	2058 ZYMATEHANDPROGRAMMING	2242 ZYMATEPROGRAMMING
C' :	206 DISPLAY	206 LAST	207 DISPLAY	207 LAST

FUNCT: CLEARNAMEAREA		FILE=ORCA1.CC		
USERS:	552 MONUMENTSCREEN		228 LAST	228 DISPLAY
CALLS:	227 DISPLAY	227 LAST		

FUNCT: COMMUNICATEWITHROBOT		FILE=ORCA3.CC		
USERS:	99 GETPOSITION	289 DOPOSITIONCONTROL	318 REDOPOSITIONCONTROL	326 REDOPOSITIONCONTROL
	529 LOADDATABASE	776 ZYMATEHANDWAIT	780 GETCALIBRATIONDATA	784 GETCALIBRATIONDATA
	790 ZYMATEHANDWAIT	818 SAVECALIBRATIONDATA	821 SAVECALIBRATIONDATA	882 LOADDATAWRIST
	934 GETWRISTFORCEVALUES	1015 CALIBRATIONSCREEN	1019 CALIBRATIONSCREEN	1118 WRISTCALIBRATIONSCREEN
	1604 MOVETOLOCATIONSCREEN	1614 MOVETOLOCATIONSCREEN	1624 MOVETOLOCATIONSCREEN	2601 INITZYMATE
	2662 INITZYMATE			
CALLS:	231 COMPUTECHECKSUM	235 SENDMESSAGEILLGOODSTATUS	242 RETURNCHECKSUMOK	

FUNCT: COMPUTEABSOLUTE		FILE=ORCA2.CC		
USERS:	1536 MOVETOLOCATIONSCREEN	2506 INITZYMATE		
CALLS:	294 SAL	295 SAL	296 SAL	

FUNCT: COMPUTECHECKSUM		FILE=ORCA3.CC		
USERS:	231 COMMUNICATEWITHROBOT			
CALLS:				

FUNCT: COMPUTEHAND		FILE=ORCA2.CC		
USERS:	1548 MOVETOLOCATIONSCREEN	2514 INITZYMATE		
CALLS:	310 SAL	311 SAL	312 SAL	

FUNCT: COMPUTERACKLOCATION		FILE=ORCA2.CC		
USERS:	2526 INITZYMATE	2813 INITZYMATE		
CALLS:	1286 MOVETORACKINDEX	1290 GETRAM	1291 MOV8	1292 LOOKUPEXPSYMBOL
	1296 FIX	1302 TYPES	1303 TYPEN	1304 TYPECRLF

FUNCT: COMPUTERELATIVE		FILE=ORCA2.CC		
USERS:	1542 MOVETOLOCATIONSCREEN	2510 INITZYMATE		
CALLS:	302 SAL	303 SAL	304 SAL	

FUNCT: DELETETCOMMANDESCREEN		FILE=ORCA1.CC		
USERS:	2114 ZYMATEHANDPROGRAMMING	2224 ZYMATEPROGRAMMING		
CALLS:	2015 CLEARFUNCTIONAREA	2017 DISPLAY	2018 DISPLAY	2019 FINPUT
	2032 DISPLAY	2036 DELETEDEXPSYMBOL	2039 DISPLAY	2043 DISPLAY

FUNCT: DISPLAYBASEFORCES		FILE=ORCA2.CC		
USERS:	526 BASESENSESCREEN			
CALLS:	637 DISPLAY	641 DISPLAY	644 IABS	644 UNSIGN
	652 DISPLAY	655 UNSIGN	655 IABS	656 DISPLAYNUMBER
	663 DISPLAY	666 IABS	666 UNSIGN	667 DISPLAYNUMBER

FUNCT: DISPLAYBASEFUNCTIONKEYS		FILE=ORCA1.CC		
USERS:	1349 HANDDEFINITIONSCREEN	2154 ZYMATEPROGRAMMING	2243 ZYMATEPROGRAMMING	
CALLS:	362 DISPLAY	363 DISPLAY	364 DISPLAY	365 DISPLAY
	368 DISPLAY	369 DISPLAY	370 DISPLAY	371 DISPLAY

FUNCT: DISPLAYCOLLISIONMESSAGE		FILE=ORCA2.CC		
USERS:	349 STOPANDREINITROBOT			
CALLS:	211 DISPLAY	217 TYPEN	221 SHR	223 TYPEN
	235 TYPEN	241 TYPEN	245 SHR	247 TYPEN
	253 TYPEN	259 TYPEN		

FUNCT: DISPLAYCURRENTGRIPFORCE		FILE=ORCA2.CC		
USERS:	1254 HANDSENSESCREEN			
CALLS:	620 DISPLAY	624 DISPLAY	627 UNSIGN	627 IABS

FUNCT: DISPLAYCURRENTHAND		FILE=ORCA2.CC		
USERS:	998 RACKSETUPSCREEN	1109 RACKSETUPSCREEN	1385 HANDDEFINITIONSCREEN	1408 INPUTANDMOVETORACKINDEX
CALLS:	883 DISPLAY	886 FDISPLAY		

FUNCT: DISPLAYHANDFUNCTIONKEYS		FILE=ORCA1.CC		
USERS:	1355 HANDDEFINITIONSCREEN	2059 ZYMATEHANDPROGRAMMING		
CALLS:	377 DISPLAY	378 DISPLAY	379 DISPLAY	380 DISPLAY
	383 DISPLAY	384 DISPLAY	385 DISPLAY	

FUNCT: DISPLAYMAINSCEEN		FILE=ORCA1.CC		
USERS:	2153 ZYMATEPROGRAMMING			
CALLS:	336 DISPLAY	337 DISPLAY	338 DISPLAY	339 DISPLAY
	342 DISPLAY	343 DISPLAY	344 DISPLAY	345 DISPLAY
	347 DISPLAY	348 DISPLAY	349 DISPLAY	350 DISPLAY

	1170 HANDKEYS	1171 SIZE	1171 FINDB	1176 STORECOMMANDVARIABLE
	1182 STORECOMMANDVARIABLE			

FILE=ORCA1.CC				
USERS: 2098 ZYMATEHANDPROGRAMMING				1285 LOOKUPEXPSYMBOL
CALLS: 1278 CLEARFUNCTIONAREA	1282 LOW	1283 HIGH	1304 SAL	1318 LOOKUPEXPSYMBOL
1296 LOOKUPEXPSYMBOL	1299 DISPLAY	1303 SAL	1311 FINPUT	1349 DISPLAYBASEFUNCTIONKEYS
1309 DISPLAY	1310 DISPLAY	1348 CLEARKEYBOXES	1351 LAST	1352 DISPLAY
1341 DISPLAY	1342 MOVEHANDTILLACKNOWLEDGE	1370 FLOAT	1372 SIN	1375 SIZE
1350 LAST	1351 DISPLAY	1372 FLOAT	1388 DISPLAY	1394 DISPLAY
1354 CLEARKEYBOXES	1355 DISPLAYHANDFUNCTIONKEYS			
1370 FIX	1372 FIX			
1373 GETDICTIONARYHANDOFFSETS	1374 MOVB			
1382 CHANGEEXPSYMBOL	1385 DISPLAYCURRENTHAND			

FILE=ORCA2.CC				
FUNCT: HANDKEYS				1251 HANDSENSESCREEN
USERS: 876 MOVEHANDTILLACKNOWLEDGE	1170 HANDCOORDINATESCREEN	1209 HANDSPEEDSCREEN	522 INPUT	531 LOADDATAWRIST
CALLS: 513 STROBECHAR	513 FORCEUPPER	581 MOVEHAND	583 RECEIVEMESSAGETIMEDWAIT	
574 DISPLAY	578 TELLPOSITION			
591 STOPANDREINITROBOT				

FILE=ORCA1.CC				
FUNCT: HANDFUNCTIONSCREEN				2094 ZYMATEHANDPROGRAMMING
USERS: 2061 ZYMATEHANDPROGRAMMING	2082 ZYMATEHANDPROGRAMMING	2088 ZYMATEHANDPROGRAMMING	413 DISPLAY	414 DISPLAY
CALLS: 411 DISPLAY	412 DISPLAY	419 DISPLAY	420 DISPLAY	
417 DISPLAY	418 DISPLAY			

FILE=ORCA1.CC				
FUNCT: HANDSENSESCREEN				1241 DISPLAY
USERS: 2092 ZYMATEHANDPROGRAMMING				1252 SIZE
CALLS: 1237 CLEARFUNCTIONAREA	1239 DISPLAY	1240 DISPLAY	1262 STORECOMMANDVARIABLE	1265 STORECOMMANDVARIABLE
1246 LAST	1251 HANDKEYS	1252 FINDB		
1254 DISPLAYCURRENTGRIPFORCE	1259 STORECOMMANDVARIABLE			

FILE=ORCA1.CC				
FUNCT: HANDSPEEDSCREEN				1199 DISPLAY
USERS: 2086 ZYMATEHANDPROGRAMMING				1210 FINDB
CALLS: 1195 CLEARFUNCTIONAREA	1197 DISPLAY	1198 DISPLAY	1224 STORECOMMANDVARIABLE	
1204 LAST	1209 HANDKEYS	1210 SIZE		
1218 STORECOMMANDVARIABLE	1221 STORECOMMANDVARIABLE			

FILE=ORCA1.CC				
FILE=ORCA1.CC				
USERS: 2357 GETRAM	2359 SIZE	2365 LOW	2366 HIGH	
2373 STOREEXPSYMBOL	2376 TYPEN	2377 TYPECRLF	2383 SIZE	
2388 CHANGEEXPSYMBOL	2391 TYPEN	2392 TYPECRLF	2394 FREERAM	
2413 LOADDATAWRIST	2414 LOADDATABASE	2419 RECEIVEMESSAGE	2430 SHR	
2451 CLEARSCREEN	2453 TYPEN	2457 TYPEN	2461 TYPEN	
2469 TYPEN	2471 TYPECRLF	2472 TYPEN	2476 FORCEUPPER	
2487 TYPECRLF	2488 RETURNTOEXEC	2497 GETRAM	2501 ZYMATEPROGRAMMING	
2506 COMPUTEABSOLUTE	2510 COMPUTERELATIVE	2514 COMPUTEHAND	2520 TYPEN	
2526 COMPUTERACKLOCATION	2549 TESTNEWFORPENDING	2550 RANGECHECKPOSITION	2551 FIX	
2562 TESTNEWFORPENDING	2563 RANGECHECKPOSITION	2564 FIX	2568 FLOAT	
2576 RANGECHECKPOSITION	2577 FIX	2581 FLOAT	2596 FIX	
2598 SETUPROBOTMESSAGE	2601 COMMUNICATEWITHROBOT	2604 GETPOSITION	2610 STOPMONITOR	
2618 RECEIVEMESSAGETIMEDWAIT	2619 GETWRISTFORCEVALUES	2620 FLOAT	2635 FIX	
2637 VIBRATORUNITS	2638 COMMUNICATEWITHROBOT	2642 FLOAT	2657 FIX	
2662 COMMUNICATEWITHROBOT	2666 FLOAT	2673 RANGECHECKEDSPEEDIN	2677 LOADDATABASEWAIT	
2681 FLOAT	2688 RANGECHECKEDSPEEDIN	2689 LOADDATABASEWAIT	2693 FLOAT	
2700 RANGECHECKEDSPEEDIN	2701 LOADDATABASEWAIT	2705 SIGNED	2705 FLOAT	
2713 LOADDATABASEWAIT	2717 FLOAT	2717 SIGNED	2724 RANGECHECKEDSPEEDIN	
2729 SIGNED	2729 FLOAT	2736 RANGECHECKEDSPEEDIN	2737 LOADDATAWRISTWAIT	
2741 FLOAT	2748 RANGECHECKEDSPEEDIN	2749 LOADDATAWRISTWAIT	2753 FLOAT	
2764 GETWRISTFORCEVALUES	2776 ZYMATEWAIT	2777 RECEIVEMESSAGETIMEDWAIT	2778 GETBASEFORCEVALUES	
2782 ZYMATEWAIT	2783 RECEIVEMESSAGETIMEDWAIT	2784 GETBASEFORCEVALUES	2785 FLOAT	
2789 RECEIVEMESSAGETIMEDWAIT	2790 GETBASEFORCEVALUES	2791 FLOAT	2794 GETRAM	
2799 LOOKUPEXPSYMBOL	2804 SAL	2805 SAL	2806 SAL	
2827 TYPEN	2828 TYPECRLF	2836 TYPEN	2837 TYPECRLF	
2847 LOADDATABASEWAIT	2863 GETDICTIONARYHANDOFFSETS	2865 MOVB	2871 TESTNEWFORPENDING	
2873 FIX	2877 FLOAT	2884 TESTNEWFORPENDING	2885 RANGECHECKPOSITION	
2891 GETPOSITION	2892 FLOAT	2899 TESTNEWFORPENDING	2900 RANGECHECKPOSITION	
2905 FLOAT	2914 RETURNTOEXEC	2920 ZYMATEWAIT	2925 MOVEZYIMATE	
2938 ZYMATEHANDWAIT	2943 MOVEHAND	2946 ZYMATEHANDWAIT	2954 RETURNTOEXEC	
2965 RETURNTOEXEC				

FILE=ORCA2.CC				
USERS: 2412 INITZYIMATE				1342 RESETMESSAGEAREANDUART
CALLS: 1338 GETRAM	1338 SIZE	1340 CREATEEXCHANGE	1358 CURRENTCS	1363 CREATETASK
1355 GETRAM	1356 MOVB	1373 LAST	1400 ZYMATEWAIT	1386 GETPOSITION
1366 GETCALIBRATIONDATA	1368 SETFACTORYCAL			1401 ZYMATEHANDWAIT
1391 GETPOSITION	1394 MOVEHAND			

354 DISPLAY	356 DISPLAY		
DISPLAYNUMBER	FILE=ORCA3.CC		
S: 628 DISPLAYCURRENTGRIPFORCE	645 DISPLAYBASEFORCES	656 DISPLAYBASEFORCES	667 DISPLAYBASEFORCES
CALLS: 1088 DISPLAY			
FUNCT: DIVRND	FILE=ORCA3.CC		
USERS: 935 GETWRISTFORCEVALUES	936 GETWRISTFORCEVALUES	937 GETWRISTFORCEVALUES	2597 INITZYMATE
CALLS:			
FUNCT: DOBASEZEROS	FILE=ORCA1.CC		
USERS: 997 CALIBRATIONSCREEN			
CALLS: 839 STROBECHAR	839 FORCEUPPER	848 INPUT	881 MOVEZYMATE
FUNCT: DOCAL	FILE=ORCA1.CC		
USERS: 979 CALIBRATIONSCREEN	981 CALIBRATIONSCREEN	1083 WRISTCALIBRATIONSCREEN	1085 WRISTCALIBRATIONSCREEN
CALLS: 776 STROBECHAR	780 VALUEENTERED	788 ASCIIITOREAL	801 FIX
804 LOW	804 DOUBLE	804 UNSIGN	804 DDIV
804 DOUBLE	805 UNSIGN	805 UNSIGN	805 SIGNED
805 SIGNED	805 SIGNED	808 SIGNED	813 DISPLAY
FUNCT: DOPOSITIONCONTROL	FILE=ORCA3.CC		
USERS: 680 MOVEZYMATE	836 MOVEHAND		
CALLS: 282 SETUPROBOTMESSAGE	283 LOW	284 HIGH	285 LOW
288 HIGH	289 COMMUNICATEWITHROBOT	290 STOPMONITOR	
FUNCT: DOWNRISTZEROS	FILE=ORCA1.CC		
USERS: 1100 WRISTCALIBRATIONSCREEN			
CALLS: 906 STROBECHAR	906 FORCEUPPER	915 INPUT	948 MOVEHAND
FUNCT: FORCEUPPER	FILE=ORCA2.CC		
USERS: 412 BASEFKEYS	513 HANDFKEYS	593 MONUMENTSCREEN	608 MONUMENTSCREEN
971 CALIBRATIONSCREEN	1017 RACKSETUPSCREEN	1048 RACKSETUPSCREEN	1075 WRISTCALIBRATIONSCREEN
2256 ZYMATEPROGRAMMING	2476 INITZYMATE		
CALLS:			
FUNCT: GETBASEFORCEVALUES	FILE=ORCA3.CC		
USERS: 525 BASESENSESCREEN	2778 INITZYMATE	2784 INITZYMATE	2790 INITZYMATE
CALLS: 919 SETUPROBOTMESSAGE	920 COMMUNICATEWITHROBOT	921 TOINTEGER	922 TOINTEGER
FUNCT: GETCALIBRATIONDATA	FILE=ORCA2.CC		
USERS: 1366 INITZYMATEROBOT			
CALLS: 779 SETUPROBOTMESSAGE	780 COMMUNICATEWITHROBOT	783 SETUPROBOTMESSAGE	784 COMMUNICATEWITHROBOT
788 COMMUNICATEWITHROBOT	789 MOVW		
FUNCT: GETDICTIONARYHANDOFFSETS	FILE=ORCA2.CC		
USERS: 1077 RACKSETUPSCREEN	1373 HANDDEFINITIONSCREEN	1740 MOVETOLOCATIONSCREEN	2863 INITZYMATE
CALLS: 893 SAL	894 SAL	895 SAL	
FUNCT: GETPOSITION	FILE=ORCA2.CC		
USERS: 361 STOPANDREINITROBOT	362 STOPANDREINITROBOT	1386 INITZYMATEROBOT	1391 INITZYMATEROBOT
CALLS: 98 SETUPROBOTMESSAGE	99 COMMUNICATEWITHROBOT	111 DDIV	111 DOUBLE
111 LOW	111 SIGNED	120 DMUL	120 DOUBLE
120 SIGNED	120 DDIV	120 DOUBLE	129 DOUBLE
129 DDIV	129 DMUL	129 SIGNED	129 DOUBLE
139 LOW	139 DOUBLE	139 SIGNED	139 DOUBLE
143 DDIV	143 DOUBLE	143 LOW	143 SIGNED
143 DMUL	152 DDIV	152 DOUBLE	152 DMUL
152 SIGNED	152 DOUBLE	173 DOUBLE	173 SIGNED
173 DDIV	173 DOUBLE		
FUNCT: GETSCALEDATA	FILE=ORCA1.CC		
USERS: 1567 MOVETOLOCATIONSCREEN	1572 MOVETOLOCATIONSCREEN	1577 MOVETOLOCATIONSCREEN	1582 MOVETOLOCATIONSCREEN
1597 MOVETOLOCATIONSCREEN	1619 MOVETOLOCATIONSCREEN	1748 MOVETOLOCATIONSCREEN	1753 MOVETOLOCATIONSCREEN
CALLS: 1436 FIX			
FUNCT: GETSCALEDNR1	FILE=ORCA1.CC		
USERS: 1902 MOVETOCOORDINATESSCREEN	1911 MOVETOCOORDINATESSCREEN	1920 MOVETOCOORDINATESSCREEN	1929 MOVETOCOORDINATESSCREEN
CALLS: 1875 ASCIIITOREAL	1876 FLOAT	1878 FLOAT	1882 FLOAT
FUNCT: GETWRISTFORCEVALUES	FILE=ORCA3.CC		
USERS: 1253 HANDSENSESCREEN	2619 INITZYMATE	2764 INITZYMATE	
CALLS: 933 SETUPROBOTMESSAGE	934 COMMUNICATEWITHROBOT	935 TOINTEGER	935 DIVRND
937 TOINTEGER	937 DIVRND		
FUNCT: HANDCOORDINATESCREEN	FILE=ORCA1.CC		
USERS: 2080 ZYMATEHANDPROGRAMMING			
CALLS: 1157 CLEARFUNCTIONAREA	1159 DISPLAY	1160 DISPLAY	1161 DISPLAY

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F : INPUTANDMOVETORACKINDEX		FILE=ORCA1.CC	
1553	MOVETOLOCATIONSSCREEN	1694	MOVETOLOCATIONSSCREEN
1408	DISPLAYCURRENTHAND	1409	DISPLAY
		1410	FINPUT
			1417 MOVETORACKINDEX
FUNCT: LOADDATABASE		FILE=ORCA3.CC	
USERS: 173	LOADDATABASEWAIT	430	BASEFKEYS
1633	MOVETOLOCATIONSSCREEN	1639	MOVETOLOCATIONSSCREEN
2414	INITZYMATE	435	BASEFKEYS
CALLS: 495	SETUPROBOTMESSAGE	1645	MOVETOLOCATIONSSCREEN
		678	MOVEZYMATE
		1651	MOVETOLOCATIONSSCREEN
FUNCT: LOADDATABASEWAIT		FILE=ORCA1.CC	
USERS: 2677	INITZYMATE	2689	INITZYMATE
CALLS: 172	ZYMATEWAIT	173	LOADDATABASE
		2701	INITZYMATE
			2713 INITZYMATE
FUNCT: LOADDATAWRIST		FILE=ORCA3.CC	
USERS: 185	LOADDATAWRISTWAIT	531	HANDFKEYS
2076	ZYMATEHANDPROGRAMMING	2413	INITZYMATE
CALLS: 851	SETUPROBOTMESSAGE	882	COMMUNICATEWITHROBOT
		536	HANDFKEYS
			1657 MOVETOLOCATIONSSCREEN
FUNCT: LOADDATAWRISTWAIT		FILE=ORCA1.CC	
USERS: 2725	INITZYMATE	2737	INITZYMATE
CALLS: 184	ZYMATEHANDWAIT	185	LOADDATAWRIST
		2749	INITZYMATE
FUNCT: MONUMENTSCREEN		FILE=ORCA1.CC	
USERS: 2214	ZYMATEPROGRAMMING		
CALLS: 551	CLEARFUNCTIONAREA	552	CLEARNAMEAREA
560	LOW	561	HIGH
587	DISPLAY	588	FDISPLAY
602	TYPECHAR	604	DISPLAY
635	DISPLAY	636	MOVEZYMATETILLACKNOWLEDGE
650	STOREEXPSYMBOL	654	CHANGEEXPSYMBOL
676	SIZE	676	SIZE
705	CHANGEEXPSYMBOL	708	LAST
		553	UPDATELASTNAME
		563	LOOKUPEXPSYMBOL
		589	DISPLAY
		608	FORCEUPPER
		643	DISPLAY
		659	DISPLAY
		688	DISPLAY
		708	DISPLAY
		554	LAST
		567	FINDSYMBOL
		593	FORCEUPPER
		608	GETCHAR
		644	FINPUT
		670	MOVB
		698	SETABSOLUTE
		711	DISPLAY
T: MOVEHAND		FILE=ORCA3.CC	
USERS: 380	STOPANDREINITROBOT	581	HANDFKEYS
1764	MOVETOLOCATIONSSCREEN	1950	MOVETOCOORDINATESSCREEN
CALLS: 831	CALCULATEHANDAXISCOUNTS	834	ZYMATEHANDWAIT
		851	SETFACTORYCAL
		2943	INITZYMATE
		836	DOPOSITIONCONTROL
			948 DOWRISTZEROS
FUNCT: MOVEHANDTILLACKNOWLEDGE		FILE=ORCA2.CC	
USERS: 1342	HANDDEFINITIONSSCREEN		
CALLS: 876	HANDFKEYS		
FUNCT: MOVETOCOORDINATESSCREEN		FILE=ORCA1.CC	
USERS: 2108	ZYMATEHANDPROGRAMMING	2204	ZYMATEPROGRAMMING
CALLS: 1894	UPDATELASTNAME	1895	VALUEENTERED
1911	GETSCALEDNR1	1913	VALUEENTERED
1926	RESTOREPOSITION	1929	GETSCALEDNR1
1940	VALUEENTERED	1944	RESTOREPOSITION
1953	DISPLAY	1956	TELLPOSITION
		1899	RESTOREPOSITION
		1917	RESTOREPOSITION
		1931	VALUEENTERED
		1947	GETSCALEDNR1
		1902	GETSCALEDNR1
		1920	GETSCALEDNR1
		1935	RESTOREPOSITION
		1949	MOVEZYMATE
FUNCT: MOVETOLOCATIONSSCREEN		FILE=ORCA1.CC	
USERS: 2105	ZYMATEHANDPROGRAMMING	2201	ZYMATEPROGRAMMING
CALLS: 1464	UPDATELASTNAME	1465	LAST
1474	MOVB	1479	FINDSYMBOL
1495	VALUEENTERED	1497	ASCIITOREAL
1542	COMPUTERELATIVE	1547	DISPLAY
1567	GETSCALEDNR1	1571	RANGECHECKVALUE
1581	RANGECHECKVALUE	1582	GETSCALEDNR1
1592	GETSCALEDNR1	1596	RANGECHECKVALUE
1605	ZYMATEHANDWAIT	1610	RANGECHECKVALUE
1614	COMMUNICATEWITHROBOT	1618	RANGECHECKVALUE
1628	FLOAT	1628	FLOAT
1633	LOADDATABASE	1637	RANGECHECKVALUE
1638	UNSIGN	1639	LOADDATABASE
1644	FIX	1644	UNSIGN
1649	FLOAT	1650	UNSIGN
1655	FLOAT	1655	FLOAT
1661	RANGECHECKVALUE	1661	FLOAT
1663	LOADDATAWRIST	1667	RANGECHECKVALUE
1668	UNSIGN	1669	LOADDATAWRIST
1678	LOOKUPEXPSYMBOL	1684	SAL
1694	INPUTANDMOVETORACKINDEX	1703	DISPLAY
1743	DISPLAYCURRENTHAND	1747	RANGECHECKVALUE
1757	RANGECHECKVALUE	1758	GETSCALEDNR1
1774	DISPLAY	1785	DISPLAY
1797	DISPLAY	1800	DISPLAY
		1465	DISPLAY
		1482	MOVB
		1535	DISPLAY
		1548	COMPUTEHAND
		1572	GETSCALEDNR1
		1586	RANGECHECKVALUE
		1597	GETSCALEDNR1
		1611	FIX
		1619	GETSCALEDNR1
		1628	RANGECHECKVALUE
		1637	FLOAT
		1643	FLOAT
		1645	LOADDATABASE
		1650	FIX
		1656	FIX
		1661	FLOAT
		1667	FLOAT
		1673	UPDATELASTNAME
		1685	SAL
		1711	DISPLAY
		1748	GETSCALEDNR1
		1763	MOVEZYMATE
		1788	DISPLAY
		1809	DISPLAY
		1466	DISPLAY
		1488	DISPLAY
		1536	COMPUTEABSOLUTE
		1553	INPUTANDMOVETORACKINDEX
		1576	RANGECHECKVALUE
		1587	GETSCALEDNR1
		1601	SETUPROBOTMESSAGE
		1612	SETUPROBOTMESSAGE
		1621	SETUPROBOTMESSAGE
		1629	FIX
		1637	FLOAT
		1643	RANGECHECKVALUE
		1649	FLOAT
		1651	LOADDATABASE
		1656	UNSIGN
		1662	FIX
		1667	FLOAT
		1674	FINPUT
		1686	SAL
		1740	GETDICTIONARYHANDOFFSETS
		1752	RANGECHECKVALUE
		1764	MOVEHAND
		1791	DISPLAY
		1812	DISPLAY

1824 TELLPOSITION 1841 FDISPLAY	1829 MOV8 1845 DISPLAY	1830 REALTOASCII 1851 DISPLAY	1834 MOV8

FUNCT: MOVETORACKINDEX USERS: 1120 RACKSETUPSCREEN CALLS: 910 FIX 933 SIGNED 934 SIGNED 937 FIX 944 COS	FILE=ORCA2.CC 1156 RACKSETUPSCREEN 919 TYPEN 933 FLOAT 935 SIGNED 941 SQR 950 FIX	1197 RACKSETUPSCREEN 920 TYPECLF 934 FLOAT 935 FLOAT 942 ATAN 955 FIX	1286 COMPUTERACKLOCATION 925 DISPLAY 934 SIGNED 935 FLOAT 943 FLOAT 964 FIX

FUNCT: MOVEZYMATE USERS: 379 STOPANDREINITROBOT 1158 RACKSETUPSCREEN 2925 INITZYMATE CALLS: 559 CALCULATEBASEAXISCOUNTS 578 IABS	FILE=ORCA3.CC 495 BASEFKEYS 1199 RACKSETUPSCREEN 576 UNSIGN 674 ZYMAWAIT	838 SETFACTORYCAL 1390 INITZYMATEROBOT 576 IABS 678 LOADDATABASE	881 DOBASEZEROS 1763 MOVETOLOCATIONSCREEN 577 IABS 680 DOPOSITIONCONTROL

FUNCT: MOVEZYMATETILLACKNOWLEDGE USERS: 636 MONUMENTSCREEN 1353 HANDDEFINITIONSCREEN CALLS: 863 BASEFKEYS	FILE=ORCA2.CC 1115 RACKSETUPSCREEN 866 LOADDATABASE	1126 RACKSETUPSCREEN	1163 RACKSETUPSCREEN

FUNCT: PROGRAMMINGCOMMANDSCREEN USERS: 2218 ZYMAETPROGRAMMING CALLS: 724 CLEARFUNCTIONAREA 731 DISPLAY 745 STOREIMMEDIATECOMMAND	FILE=ORCA1.CC 726 DISPLAY 734 LAST 748 STOREIMMEDIATECOMMAND	727 DISPLAY 739 BASEFKEYS 751 STOREIMMEDIATECOMMAND	728 DISPLAY 740 FINDB 754 STOREIMMEDIATECOMMAND

FUNCT: RACKSETUPSCREEN USERS: 2210 ZYMAETPROGRAMMING CALLS: 995 GETRAM 1005 LOOKUPEXPSYMBOL 1035 DISPLAY 1056 DISPLAY 1068 LAST 1089 DISPLAY 1115 MOVEZYMATETILLACKNOWLEDGE 1124 DISPLAY 1132 SQR 1135 SIN 1156 MOVETORACKINDEX 1162 DISPLAY 1170 FLOAT 1173 COS 1185 FINPUT 1202 FDISPLAY 1210 FLOAT 1212 FLOAT 1214 SIN 1240 DISPLAY 1256 STOREEXPSYMBOL	FILE=ORCA2.CC 996 CLEARFUNCTIONAREA 1016 DISPLAY 1039 DISPLAY 1057 FINPUT 1071 LOOKUPEXPSYMBOL 1098 FDISPLAY 1120 MOVETORACKINDEX 1125 DISPLAY 1133 FLOAT 1136 FLOAT 1157 TELLPOSITION 1163 MOVEZYMATETILLACKNOWLEDGE 1170 FLOAT 1174 SIN 1197 MOVETORACKINDEX 1203 DISPLAY 1211 ATAN 1213 FLOAT 1214 FLOAT 1241 MOVEZYMATETILLACKNOWLEDGE 1260 CHANGEEXPSYMBOL	997 UPDATALASTNAME 1017 FORCEUPPER 1047 DISPLAY 1063 DISPLAY 1077 GETDICTIONARYHANDOFFSETS 1109 DISPLAYCURRENTHAND 1121 TELLPOSITION 1126 MOVEZYMATETILLACKNOWLEDGE 1133 ATAN 1137 DISPLAY 1158 MOVEZYMATE 1168 FLOAT 1170 ATAN 1175 FLOAT 1198 TELLPOSITION 1204 MOVEZYMATETILLACKNOWLEDGE 1211 FLOAT 1213 SIGNED 1215 SIGNED 1246 FLOAT 1265 DISPLAY	998 DISPLAYCURRENTHAND 1017 GETCHAR 1048 FORCEUPPER 1067 FINPUT 1078 MOV8 1111 LOADDATABASE 1122 MOVEZYMATE 1131 FLOAT 1133 FLOAT 1141 FDISPLAY 1160 DISPLAY 1169 SORT 1171 FLOAT 1176 DISPLAY 1199 MOVEZYMATE 1209 FLOAT 1211 FLOAT 1213 COS 1215 FLOAT 1248 SIZE 1269 DISPLAY

FUNCT: RANGECHECKEDSPEEDIN USERS: 2673 INITZYMATE 2748 INITZYMATE CALLS: 2289 FLOAT 2297 SIGNED	FILE=ORCA1.CC 2688 INITZYMATE 2289 SIGNED 2297 FLOAT	2700 INITZYMATE 2291 FLOAT 2301 FIX	2712 INITZYMATE 2291 SIGNED 2301 UNSIGN

FUNCT: RANGECHECKPOSITION USERS: 2550 INITZYMATE CALLS:	FILE=ORCA1.CC 2563 INITZYMATE	2576 INITZYMATE	2872 INITZYMATE

FUNCT: RANGECHECKVALUE USERS: 1566 MOVETOLOCATIONSCREEN 1596 MOVETOLOCATIONSCREEN 1643 MOVETOLOCATIONSCREEN 1747 MOVETOLOCATIONSCREEN CALLS:	FILE=ORCA1.CC 1571 MOVETOLOCATIONSCREEN 1610 MOVETOLOCATIONSCREEN 1649 MOVETOLOCATIONSCREEN 1752 MOVETOLOCATIONSCREEN	1576 MOVETOLOCATIONSCREEN 1618 MOVETOLOCATIONSCREEN 1655 MOVETOLOCATIONSCREEN 1757 MOVETOLOCATIONSCREEN	1581 MOVETOLOCATIONSCREEN 1628 MOVETOLOCATIONSCREEN 1661 MOVETOLOCATIONSCREEN

FUNCT: REDOPOSITIONCONTROL USERS: 416 ZYMAWAIT 311 SETUPROBOTMESSAGE 317 HIGH 322 LOW	FILE=ORCA3.CC 793 ZYMAWAIT 312 LOW 318 COMMUNICATEWITHROBOT 323 HIGH	313 HIGH 319 SETUPROBOTMESSAGE 324 LOW	314 LOW 320 LOW 325 HIGH

FUNCT: RESETMESSAGEAREAANDUART USERS: 167 SENDMESSAGEILLGOODSTATUS	FILE=ORCA3.CC 1342 INITZYMATEROBOT		

CALLS:	118 TIME 134 TIME	122 TIME	125 TIME	127 TIME

FUNCTION:	RESTOREPOSITION	FILE=ORCA1.CC		
USERS:	1899 MOVETOCOORDINATESCREEN	1908 MOVETOCOORDINATESCREEN	1917 MOVETOCOORDINATESCREEN	1926 MOVETOCOORDINATESCREEN
	2232 ZYMATEPROGRAMMING			
CALLS:	1866 TELLPOSITION			

FUNCTION:	RETURNCHECKSUMOK	FILE=ORCA3.CC		
USERS:	242 COMMUNICATEWITHROBOT			
CALLS:				

FUNCTION:	RETURNTOEXEC	FILE=ORCA1.CC		
USERS:	2488 INITZYMATE	2914 INITZYMATE	2954 INITZYMATE	2959 INITZYMATE
CALLS:	2342 SENDMESSAGE			

FUNCTION:	SAVECALIBRATIONDATA	FILE=ORCA2.CC		
USERS:	1033 CALIBRATIONSCREEN	1043 CALIBRATIONSCREEN	1136 WRISTCALIBRATIONSCREEN	1146 WRISTCALIBRATIONSCREEN
CALLS:	816 SETUPROBOTMESSAGE	817 MOVW	818 COMMUNICATEWITHROBOT	819 SETUPROBOTMESSAGE

FUNCTION:	SENDMESSAGEUNTILGOODSTATUS	FILE=ORCA3.CC		
USERS:	235 COMMUNICATEWITHROBOT			
CALLS:	160 SENDMESSAGE	161 RECEIVEMESSAGE	167 RESETMESSAGEAREAANDUART	172 CLEARSCREEN
	175 FDISPLAY	179 RELEASE		

FUNCTION:	SETABSOLUTE	FILE=ORCA2.CC		
USERS:	698 MONUMENTSCREEN	761 STOREROBOTPOSITION	1981 CHANGELOCATIONSCREEN	
CALLS:	268 SAR	270 SAR	272 SAR	

FUNCTION:	SETFACTORYCAL	FILE=ORCA2.CC		
USERS:	1032 CALIBRATIONSCREEN	1135 WRISTCALIBRATIONSCREEN	1368 INITZYMATEROBOT	
CALLS:	838 MOVEZYMATE	851 MOVEHAND		

FUNCTION:	SETHAND	FILE=ORCA2.CC		
USERS:	755 STOREROBOTPOSITION	1989 CHANGELOCATIONSCREEN		
S:	286 SAR	287 SAR	288 SAR	

FUNCTION:	SETRELATIVE	FILE=ORCA2.CC		
S:	766 STOREROBOTPOSITION	1985 CHANGELOCATIONSCREEN		
CALLS:	278 SAR	279 SAR	280 SAR	

FUNCTION:	SETUPROBOTMESSAGE	FILE=ORCA3.CC		
USERS:	98 GETPOSITION	282 DOPOSITIONCONTROL	311 REDOPOSITIONCONTROL	319 REDOPOSITIONCONTROL
	358 ZYMATEWAIT	495 LOADDATABASE	774 ZYMATEHANDWAIT	779 GETCALIBRATIONDATA
	787 GETCALIBRATIONDATA	816 SAVECALIBRATIONDATA	819 SAVECALIBRATIONDATA	851 LOADDATAWRIST
	933 GETWRISTFORCEVALUES	1014 CALIBRATIONSCREEN	1018 CALIBRATIONSCREEN	1117 WRISTCALIBRATIONSCREEN
	1601 MOVETOLOCATIONSCREEN	1612 MOVETOLOCATIONSCREEN	1621 MOVETOLOCATIONSCREEN	2598 INITZYMATE
CALLS:	2659 INITZYMATE			
	146 SIZE			

FUNCTION:	STOPANDREINITROBOT	FILE=ORCA2.CC		
USERS:	422 ZYMATEWAIT	505 BASEFKEYS	591 HANDFKEYS	800 ZYMATEHANDWAIT
CALLS:	338 TYPEN	342 DISPLAY	349 DISPLAYCOLLISIONMESSAGE	352 TYPEN
	361 GETPOSITION	362 GETPOSITION	373 TELLPOSITION	379 MOVEZYMATE
	383 STROBEKEYPAD	386 STROBEKEYPAD	389 DISPLAY	389 LAST

FUNCTION:	STOPMONITOR	FILE=ORCA3.CC		
USERS:	290 DOPOSITIONCONTROL	2610 INITZYMATE		
CALLS:	256 SENDMESSAGE			

FUNCTION:	STOPPROGRAM	FILE=ORCA2.CC		
USERS:				
CALLS:	1412 GETRAM	1412 SIZE	1429 SIZE	1436 RECEIVEMESSAGE
	1446 RECEIVEMESSAGE			

FUNCTION:	STOREANDCHECKSYMBOL	FILE=ORCA2.CC		
USERS:	712 STORECOMMANDVARIABLE	733 STOREIMMEDIATECOMMAND	772 STOREROBOTPOSITION	
CALLS:	673 MOVW	674 STOREEXPSYMBOL	677 DISPLAY	683 DISPLAY

FUNCTION:	STORECOMMANDVARIABLE	FILE=ORCA2.CC		
USERS:	446 BASECOORDINATESCREEN	449 BASECOORDINATESCREEN	452 BASECOORDINATESCREEN	485 BASESPEEDSCREEN
	494 BASESPEEDSCREEN	531 BASESENSESCREEN	534 BASESENSESCREEN	537 BASESENSESCREEN
	1179 HANDCOORDINATESCREEN	1182 HANDCOORDINATESCREEN	1215 HANDSPEEDSCREEN	1218 HANDSPEEDSCREEN
	1224 HANDSPEEDSCREEN	1259 HANDSENSESCREEN	1262 HANDSENSESCREEN	1265 HANDSENSESCREEN
CALLS:	701 DISPLAY	701 LAST	702 FINPUT	705 SIZE

FUNCTION:	STOREIMMEDIATECOMMAND	FILE=ORCA2.CC		
USERS:	745 PROGRAMMINGCOMMANDSCREEN	748 PROGRAMMINGCOMMANDSCREEN	751 PROGRAMMINGCOMMANDSCREEN	754 PROGRAMMINGCOMMANDSCREEN

CALLS:	722 DISPLAY	722 LAST	723 FINPUT	726 SIZE
FUNCT: STOREROBOTPOSITION	FILE=ORCA2.CC			
USERS: 2102 ZYMATEHANDPROGRAMMING	2189 ZYMATEPROGRAMMING	2192 ZYMATEPROGRAMMING		
CALLS: 741 UPDTELASTNAME	742 FINPUT	745 SIZE	745 SIZE	
761 SETABSOLUTE	762 DISPLAY	766 SETRELATIVE	767 DISPLAY	
FUNCT: TELLPOSITION	FILE=ORCA3.CC			
USERS: 373 STOPANDREINITROBOT	492 BASEFKEYS	578 HANDFKEYS	1049 CALIBRATIONSCREEN	
1157 RACKSETUPSCREEN	1198 RACKSETUPSCREEN	1824 MOVETOLOCATIONSCREEN	1866 RESTOREPOSITION	
2063 ZYMATEHANDPROGRAMMING	2157 ZYMATEPROGRAMMING			
CALLS: 979 DISPLAY	983 DISPLAY	984 UNSIGN	984 SAR	
997 DISPLAY	998 SAR	998 UNSIGN	999 FDISPLAY	
1011 DISPLAY	1012 UNSIGN	1012 SAR	1013 FDISPLAY	
1027 DISPLAY	1028 IABS	1028 UNSIGN	1028 SAR	
1030 DISPLAY	1034 DISPLAY	1035 UNSIGN	1035 SAR	
1037 DISPLAY	1047 DISPLAY	1051 DISPLAY	1052 UNSIGN	
1053 FDISPLAY	1061 DISPLAY	1065 DISPLAY	1066 UNSIGN	
1067 FDISPLAY				
FUNCT: TESTHANDPOSITION	FILE=ORCA3.CC			
USERS: 568 HANDFKEYS	752 CALCULATEHANDAXISCOUNTS			
CALLS:				
FUNCT: TESTNEWFORPENDING	FILE=ORCA1.CC			
USERS: 2549 INITZYMATE	2562 INITZYMATE	2575 INITZYMATE	2871 INITZYMATE	
CALLS:				
FUNCT: TESTZYMATEPOSITION	FILE=ORCA3.CC			
USERS: 477 CALCULATEBASEAXISCOUNTS	482 BASEFKEYS			
CALLS:				
FUNCT: TOINTEGER	FILE=ORCA3.CC			
USERS: 921 GETBASEFORCEVALUES	922 GETBASEFORCEVALUES	923 GETBASEFORCEVALUES	935 GETWRISTFORCEVALUES	
CALLS: 891 SIGNED	895 SIGNED			
FUNCT: UPDTELASTNAME	FILE=ORCA2.CC			
USERS: 553 MONUMENTSCREEN	741 STOREROBOTPOSITION	997 RACKSETUPSCREEN	1464 MOVETOLOCATIONSCREEN	
1962 CHANGELOCATIONSCREEN	2158 ZYMATEPROGRAMMING			
CALLS: 600 LAST	600 DISPLAY	601 DISPLAY	601 LAST	
603 LAST	603 DISPLAY	604 FDISPLAY	605 LAST	
FUNCT: VALUEENTERED	FILE=ORCA1.CC			
USERS: 780 DOCLAL	1495 MOVETOLOCATIONSCREEN	1895 MOVETOCOORDINATESSCREEN	1904 MOVETOCOORDINATESSCREEN	
1931 MOVETOCOORDINATESSCREEN	1940 MOVETOCOORDINATESSCREEN			
CALLS: 267 CURSORON	268 DISPLAY	272 GETCHAR	276 CURSOROFF	
289 DISPLAY	294 TYPECHAR	302 CURRUBOUT	309 CURSOROFF	
FUNCT: VIBRATORUNITS	FILE=ORCA1.CC			
USERS: 1613 MOVETOLOCATIONSCREEN	2637 INITZYMATE			
CALLS: 144 IABS	148 IABS			
FUNCT: WRISTCALIBRATIONSCREEN	FILE=ORCA1.CC			
USERS: 2118 ZYMATEHANDPROGRAMMING				
CALLS: 1067 CLEARFUNCTIONAREA	1068 DISPLAY	1069 DISPLAY	1070 DISPLAY	
1075 STROBECHAR	1083 DOCLAL	1084 DISPLAY	1084 LAST	
1086 DISPLAY	1086 LAST	1087 DOCLAL	1088 DISPLAY	
1095 CLEARFUNCTIONAREA	1097 DISPLAY	1098 DISPLAY	1099 DISPLAY	
1108 CLEARFUNCTIONAREA	1109 DISPLAY	1110 DISPLAY	1111 FDISPLAY	
1113 FDISPLAY	1114 FDISPLAY	1115 FDISPLAY	1116 FDISPLAY	
1118 COMMUNICATEWITHROBOT	1121 SETUPROBOTMESSAGE	1122 COMMUNICATEWITHROBOT	1124 DISPLAY	
1126 FDISPLAY	1127 FDISPLAY	1128 FDISPLAY	1129 FDISPLAY	
1135 SETFACTORYCAL	1136 SAVECALIBRATIONDATA	1146 SAVECALIBRATIONDATA	1147 DISPLAY	
1150 TELLPOSITION				
FUNCT: ZYMATEHANDPROGRAMMING	FILE=ORCA1.CC			
USERS: 2240 ZYMATEPROGRAMMING				
CALLS: 2057 DISPLAY	2058 CLEARKEYBOXES	2059 DISPLAYHANDFUNCTIONKEYS	2060 CLEARFUNCTIONAREA	
2066 LAST	2071 HANDFKEYS	2072 SIZE	2072 FINDB	
2075 LAST	2076 LOADDATAWRIST	2080 HANDCOORDINATESSCREEN	2081 CLEARFUNCTIONAREA	
2083 DISPLAY	2083 LAST	2086 HANDSPEEDSCREEN	2087 CLEARFUNCTIONAREA	
2089 LAST	2089 DISPLAY	2092 HANDSENSESCREEN	2093 CLEARFUNCTIONAREA	
2095 LAST	2095 DISPLAY	2098 HANDDEFINITIONSCREEN	2102 STOREROBOTPOSITION	
2108 MOVETOCOORDINATESSCREEN	2111 CHANGELOCATIONSCREEN	2114 DELETECOMMANDSCREEN	2118 WRISTCALIBRATIONSCREEN	
2128 TYPEN	2132 STROBECHAR	2132 FORCEUPPER	2138 LAST	
2139 CLEARFUNCTIONAREA	2140 HANDFUNCTIONSCREEN	2142 RECEIVEMESSAGETIMEDWAIT		
FUNCT: ZYMATEHANDWAIT	FILE=ORCA3.CC			

USFRS:	184 LOADDATAWRISTWAIT	834 MOVEHAND	1401 INITZYMATEROBOT	1605 MOVETOLOCATIONSCREEN
	2946 INITZYMATE			
C :	774 SETUPROBOTMESSAGE	776 COMMUNICATEWITHROBOT	785 TYPEN	786 TYPECRLF
	793 REDOPOSITIONCONTROL	800 STOPANDREINITROBOT		

FUNCT:	ZYMATEPROGRAMMING	FILE=ORCA1.CC		
USERS:	2501 INITZYMATE			
CALLS:	2152 CLEARSCREEN	2153 DISPLAYMAINSCEEN	2154 DISPLAYBASEFUNCTIONKEYS	2155 BASEFUNCTIONSCREEN
	2161 LAST	2166 BASEFKEYS	2167 SIZE	2167 FINDB
	2170 DISPLAY	2171 LOADDATABASE	2177 BASECOORDINATESCREEN	2178 CLEARFUNCTIONAREA
	2180 LAST	2180 DISPLAY	2183 BASESPEEDSCREEN	2184 CLEARFUNCTIONAREA
	2186 LAST	2186 DISPLAY	2189 STOREROBOTPOSITION	2192 STOREROBOTPOSITION
	2196 CLEARFUNCTIONAREA	2197 BASEFUNCTIONSCREEN	2198 DISPLAY	2198 LAST
	2204 MOVETOCOORDINATESSCREEN	2207 CHANGELOCATIONSCREEN	2210 RACKSETUPSCREEN	2214 MONUMENTSCREEN
	2219 CLEARFUNCTIONAREA	2220 BASEFUNCTIONSCREEN	2221 DISPLAY	2221 LAST
	2228 CALIBRATIONSCREEN	2232 RESTOREPOSITION	2240 ZYMATEHANDPROGRAMMING	2241 DISPLAY
	2243 DISPLAYBASEFUNCTIONKEYS	2244 CLEARFUNCTIONAREA	2245 BASEFUNCTIONSCREEN	2251 DISPLAY
	2256 STROBECHAR	2256 FORCEUPPER	2262 CLEARFUNCTIONAREA	2263 BASEFUNCTIONSCREEN
	2264 LAST	2266 RECEIVEMESSAGETIMEDWAIT		

FUNCT:	ZYMATEWAIT	FILE=ORCA3.CC		
USERS:	172 LOADDATABASEWAIT	674 MOVEZYMATE	1400 INITZYMATEROBOT	2776 INITZYMATE
	2920 INITZYMATE	2929 INITZYMATE		
CALLS:	350 SETUPROBOTMESSAGE	354 SETUPROBOTMESSAGE	358 SETUPROBOTMESSAGE	362 COMMUNICATEWITHROBOT
	387 TYPEN	391 SHR	393 TYPEN	399 TYPEN
	409 TYPECRLF	412 RECEIVEMESSAGETIMEDWAIT	413 COMMUNICATEWITHROBOT	416 REDOPOSITIONCONTROL

Undefined (External) Functions, Function XREF (of USERS) (2 of 2)

FUNCT: ASCII TO REAL	FILE=			
USERS: 788 DOCLAL	1497 MOVETOLOCATIONSCREEN	1875 GETSCALED RM1		

FUNCT: ATAN	FILE=			
USERS: 942 MOVETORACKINDEX	1133 RACKSETUPSCREEN	1170 RACKSETUPSCREEN	1211 RACKSETUPSCREEN	

FUNCT: CHANGE EXP SYMBOL	FILE=			
USERS: 654 MONUMENTSCREEN	705 MONUMENTSCREEN	1260 RACKSETUPSCREEN	1382 HANDDEFINITIONSCREEN	

FUNCT: CLEAR SCREEN	FILE=			
USERS: 172 SENDMESSAGE TILL GOOD STATUS	2152 ZYMATE PROGRAMMING	2451 INITZYMATE		

FUNCT: COS	FILE=			
USERS: 944 MOVETORACKINDEX	1134 RACKSETUPSCREEN	1173 RACKSETUPSCREEN	1213 RACKSETUPSCREEN	

FUNCT: CREATE EXCHANGE	FILE=			
USERS: 1340 INITZYMATEROBOT	1345 INITZYMATEROBOT	2370 INITZYMATE		

FUNCT: CREATE TASK	FILE=			
USERS: 1363 INITZYMATEROBOT				

FUNCT: CURRENT CS	FILE=			
USERS: 1358 INITZYMATEROBOT				

FUNCT: CURRUBOUT	FILE=			
USERS: 302 VALUE ENTERED				

FUNCT: CURSOR OFF	FILE=			
USERS: 276 VALUE ENTERED	309 VALUE ENTERED			

FUNCT: CURSOR ON	FILE=			
USERS: 267 VALUE ENTERED				

FUNCT: DDIV	FILE=			
USERS: 111 GETPOSITION	120 GETPOSITION	129 GETPOSITION	139 GETPOSITION	
173 GETPOSITION	478 CALCULATE BASE AXIS COUNTS	479 CALCULATE BASE AXIS COUNTS	480 CALCULATE BASE AXIS COUNTS	
759 CALCULATE HAND AXIS COUNTS	762 CALCULATE HAND AXIS COUNTS	763 CALCULATE HAND AXIS COUNTS	804 DOCLAL	

FUNCT: DELETE EXP SYMBOL	FILE=			
USERS: 571 MONUMENTSCREEN	2036 DELETED COMMAND SCREEN			

FUNCT: DISPLAY	FILE=			
USERS: 206 CLEAR KEY BOXES	207 CLEAR KEY BOXES	211 DISPLAY COLLISION MESSAGE	216 CLEAR FUNCTION AREA	
228 CLEAR NAME AREA	268 VALUE ENTERED	283 VALUE ENTERED	289 VALUE ENTERED	
337 DISPLAY MAIN SCREEN	338 DISPLAY MAIN SCREEN	339 DISPLAY MAIN SCREEN	340 DISPLAY MAIN SCREEN	
342 STOP AND REINITROBOT	342 DISPLAY MAIN SCREEN	343 DISPLAY MAIN SCREEN	344 DISPLAY MAIN SCREEN	
346 DISPLAY MAIN SCREEN	347 DISPLAY MAIN SCREEN	348 DISPLAY MAIN SCREEN	349 DISPLAY MAIN SCREEN	
354 DISPLAY MAIN SCREEN	356 DISPLAY MAIN SCREEN	362 DISPLAY BASE FUNCTION KEYS	363 DISPLAY BASE FUNCTION KEYS	
365 DISPLAY BASE FUNCTION KEYS	366 DISPLAY BASE FUNCTION KEYS	367 DISPLAY BASE FUNCTION KEYS	368 DISPLAY BASE FUNCTION KEYS	
370 DISPLAY BASE FUNCTION KEYS	371 DISPLAY BASE FUNCTION KEYS	377 DISPLAY HAND FUNCTION KEYS	378 DISPLAY HAND FUNCTION KEYS	
380 DISPLAY HAND FUNCTION KEYS	381 DISPLAY HAND FUNCTION KEYS	382 DISPLAY HAND FUNCTION KEYS	383 DISPLAY HAND FUNCTION KEYS	
385 DISPLAY HAND FUNCTION KEYS	389 STOP AND REINITROBOT	392 BASE FUNCTION SCREEN	393 BASE FUNCTION SCREEN	
395 BASE FUNCTION SCREEN	396 BASE FUNCTION SCREEN	397 BASE FUNCTION SCREEN	398 BASE FUNCTION SCREEN	
400 BASE FUNCTION SCREEN	401 BASE FUNCTION SCREEN	402 BASE FUNCTION SCREEN	403 BASE FUNCTION SCREEN	
411 HAND FUNCTION SCREEN	412 HAND FUNCTION SCREEN	413 HAND FUNCTION SCREEN	414 HAND FUNCTION SCREEN	
416 HAND FUNCTION SCREEN	417 HAND FUNCTION SCREEN	418 HAND FUNCTION SCREEN	419 HAND FUNCTION SCREEN	
429 BASE COORDINATES SCREEN	430 BASE COORDINATES SCREEN	431 BASE COORDINATES SCREEN	432 BASE COORDINATES SCREEN	
468 BASE SPEEDS SCREEN	469 BASE SPEEDS SCREEN	470 BASE SPEEDS SCREEN	471 BASE SPEEDS SCREEN	
509 BASE SENSES SCREEN	510 BASE SENSES SCREEN	511 BASE SENSES SCREEN	512 BASE SENSES SCREEN	
514 BASE SENSES SCREEN	515 BASE SENSES SCREEN	554 MONUMENT SCREEN	555 MONUMENT SCREEN	
587 MONUMENT SCREEN	589 MONUMENT SCREEN	600 UPDATE LAST NAME	601 UPDATE LAST NAME	
603 UPDATE LAST NAME	604 MONUMENT SCREEN	620 DISPLAY CURRENT GRIP FORCE	624 DISPLAY CURRENT GRIP FORCE	
637 DISPLAY BASE FORCES	641 DISPLAY BASE FORCES	643 MONUMENT SCREEN	648 DISPLAY BASE FORCES	
659 MONUMENT SCREEN	659 DISPLAY BASE FORCES	663 DISPLAY BASE FORCES	677 STORE AND CHECKS SYMBOL	
687 STORE AND CHECKS SYMBOL	688 MONUMENT SCREEN	701 STORE COMMAND VARIABLE	708 MONUMENT SCREEN	
715 MONUMENT SCREEN	722 STORE IMMEDIATE COMMAND	726 PROGRAMMING COMMAND SCREEN	727 PROGRAMMING COMMAND SCREEN	
729 PROGRAMMING COMMAND SCREEN	730 PROGRAMMING COMMAND SCREEN	731 PROGRAMMING COMMAND SCREEN	754 STOREROBOT POSITION	
767 STOREROBOT POSITION	813 DOCLAL	820 DOCLAL	883 DISPLAY CURRENT HAND	
964 CALIBRATION SCREEN	965 CALIBRATION SCREEN	966 CALIBRATION SCREEN	967 CALIBRATION SCREEN	
980 CALIBRATION SCREEN	982 CALIBRATION SCREEN	983 TELL POSITION	993 TELL POSITION	
995 CALIBRATION SCREEN	996 CALIBRATION SCREEN	997 TELL POSITION	999 RACKSETUP SCREEN	
1007 TELL POSITION	1007 CALIBRATION SCREEN	1011 TELL POSITION	1016 RACKSETUP SCREEN	
1021 TELL POSITION	1027 TELL POSITION	1030 TELL POSITION	1034 TELL POSITION	
1037 TELL POSITION	1039 RACKSETUP SCREEN	1044 CALIBRATION SCREEN	1047 RACKSETUP SCREEN	
1051 TELL POSITION	1056 RACKSETUP SCREEN	1061 TELL POSITION	1063 RACKSETUP SCREEN	

1068 RACKSETUPSCREEN	1068 WRISTCALIBRATIONSCREEN	1069 WRISTCALIBRATIONSCREEN	1070 WRISTCALIBRATIONSCREEN
1082 RACKSETUPSCREEN	1084 WRISTCALIBRATIONSCREEN	1086 WRISTCALIBRATIONSCREEN	1088 DISPLAYNUMBER
1089 RACKSETUPSCREEN	1097 WRISTCALIBRATIONSCREEN	1098 WRISTCALIBRATIONSCREEN	1099 WRISTCALIBRATIONSCREEN
1110 WRISTCALIBRATIONSCREEN	1114 RACKSETUPSCREEN	1124 WRISTCALIBRATIONSCREEN	1124 RACKSETUPSCREEN
1137 RACKSETUPSCREEN	1147 WRISTCALIBRATIONSCREEN	1159 HANDCOORDINATESCREEN	1160 HANDCOORDINATESCREEN
1161 HANDCOORDINATESCREEN	1162 HANDCOORDINATESCREEN	1162 RACKSETUPSCREEN	1176 RACKSETUPSCREEN
1198 HANDSPEEDSCREEN	1199 HANDSPEEDSCREEN	1200 HANDSPEEDSCREEN	1201 HANDSPEEDSCREEN
1203 RACKSETUPSCREEN	1239 HANDSENSESCREEN	1240 HANDSENSESCREEN	1240 RACKSETUPSCREEN
1242 HANDSENSESCREEN	1243 HANDSENSESCREEN	1265 RACKSETUPSCREEN	1269 RACKSETUPSCREEN
1299 HANDDEFINITIONSCREEN	1309 HANDDEFINITIONSCREEN	1310 HANDDEFINITIONSCREEN	1325 HANDDEFINITIONSCREEN
1350 HANDDEFINITIONSCREEN	1351 HANDDEFINITIONSCREEN	1352 HANDDEFINITIONSCREEN	1388 HANDDEFINITIONSCREEN
1398 HANDDEFINITIONSCREEN	1409 INPUTANDMOVETORACKINDEX	1465 MOVETOLOCATIONSCREEN	1466 MOVETOLOCATIONSCREEN
1494 MOVETOLOCATIONSCREEN	1535 MOVETOLOCATIONSCREEN	1541 MOVETOLOCATIONSCREEN	1547 MOVETOLOCATIONSCREEN
1711 MOVETOLOCATIONSCREEN	1767 MOVETOLOCATIONSCREEN	1774 MOVETOLOCATIONSCREEN	1785 MOVETOLOCATIONSCREEN
1791 MOVETOLOCATIONSCREEN	1794 MOVETOLOCATIONSCREEN	1797 MOVETOLOCATIONSCREEN	1800 MOVETOLOCATIONSCREEN
1812 MOVETOLOCATIONSCREEN	1815 MOVETOLOCATIONSCREEN	1845 MOVETOLOCATIONSCREEN	1851 MOVETOLOCATIONSCREEN
1974 CHANGELOCATIONSCREEN	1980 CHANGELOCATIONSCREEN	1984 CHANGELOCATIONSCREEN	1988 CHANGELOCATIONSCREEN
2001 CHANGELOCATIONSCREEN	2007 CHANGELOCATIONSCREEN	2017 DELETEDCOMMANDSCREEN	2018 DELETEDCOMMANDSCREEN
2032 DELETEDCOMMANDSCREEN	2039 DELETEDCOMMANDSCREEN	2043 DELETEDCOMMANDSCREEN	2057 ZYMATEHANDPROGRAMMING
2083 ZYMATEHANDPROGRAMMING	2089 ZYMATEHANDPROGRAMMING	2095 ZYMATEHANDPROGRAMMING	2127 ZYMATEHANDPROGRAMMING
2170 ZYMATEPROGRAMMING	2180 ZYMATEPROGRAMMING	2186 ZYMATEPROGRAMMING	2198 ZYMATEPROGRAMMING
2241 ZYMATEPROGRAMMING	2251 ZYMATEPROGRAMMING	2264 ZYMATEPROGRAMMING	

FUNCT: DMUL	FILE#			
USERS: 111 GETPOSITION	120 GETPOSITION	129 GETPOSITION	139 GETPOSITION	
173 GETPOSITION	478 CALCULATEBASEAXISCOUNTS	479 CALCULATEBASEAXISCOUNTS	480 CALCULATEBASEAXISCOUNTS	
759 CALCULATEHANDAXISCOUNTS	762 CALCULATEHANDAXISCOUNTS	763 CALCULATEHANDAXISCOUNTS	804 DOCLAL	

FUNCT: DOUBLE	FILE#			
USERS: 111 GETPOSITION	111 GETPOSITION	120 GETPOSITION	120 GETPOSITION	
139 GETPOSITION	139 GETPOSITION	143 GETPOSITION	143 GETPOSITION	
152 GETPOSITION	173 GETPOSITION	173 GETPOSITION	174 SENDMESSAGETILLGOODSTATUS	
478 CALCULATEBASEAXISCOUNTS	479 CALCULATEBASEAXISCOUNTS	479 CALCULATEBASEAXISCOUNTS	480 CALCULATEBASEAXISCOUNTS	
755 CALCULATEHANDAXISCOUNTS	755 CALCULATEHANDAXISCOUNTS	759 CALCULATEHANDAXISCOUNTS	759 CALCULATEHANDAXISCOUNTS	
762 CALCULATEHANDAXISCOUNTS	763 CALCULATEHANDAXISCOUNTS	763 CALCULATEHANDAXISCOUNTS	804 DOCLAL	
804 DOCLAL				

FUNCT: FDISPLAY	FILE#			
USERS: 173 SENDMESSAGETILLGOODSTATUS	175 SENDMESSAGETILLGOODSTATUS	588 MONUMENTSCREEN	604 UPDATALASTNAME	
999 TELLPOSITION	1008 CALIBRATIONSCREEN	1009 CALIBRATIONSCREEN	1010 CALIBRATIONSCREEN	
1012 CALIBRATIONSCREEN	1013 CALIBRATIONSCREEN	1013 TELLPOSITION	1022 CALIBRATIONSCREEN	
1024 CALIBRATIONSCREEN	1025 CALIBRATIONSCREEN	1026 CALIBRATIONSCREEN	1027 CALIBRATIONSCREEN	
1036 TELLPOSITION	1053 TELLPOSITION	1067 TELLPOSITION	1098 RACKSETUPSCREEN	
1112 WRISTCALIBRATIONSCREEN	1113 WRISTCALIBRATIONSCREEN	1114 WRISTCALIBRATIONSCREEN	1115 WRISTCALIBRATIONSCREEN	
1125 WRISTCALIBRATIONSCREEN	1126 WRISTCALIBRATIONSCREEN	1127 WRISTCALIBRATIONSCREEN	1128 WRISTCALIBRATIONSCREEN	
1130 WRISTCALIBRATIONSCREEN	1141 RACKSETUPSCREEN	1161 RACKSETUPSCREEN	1180 RACKSETUPSCREEN	
1841 MOVETOLOCATIONSCREEN				

FUNCT: FINDB	FILE#			
USERS: 441 BASECOORDINATESCREEN	480 BASESPEEDSCREEN	524 BASESENSESCREEN	740 PROGRAMMINGCOMMANDSCREEN	
1252 HANDSENSESCREEN	2072 ZYMATEHANDPROGRAMMING	2167 ZYMATEPROGRAMMING		

FUNCT: FINDSYMBOL	FILE#
USERS: 567 MONUMENTSCREEN	1479 MOVETOLOCATIONSCREEN

FUNCT: FINPUT	FILE#			
USERS: 644 MONUMENTSCREEN	702 STORECOMMANDVARIABLE	723 STOREIMMEDIATECOMMAND	742 STOREROBOTPOSITION	
1067 RACKSETUPSCREEN	1146 RACKSETUPSCREEN	1185 RACKSETUPSCREEN	1311 HANDDEFINITIONSCREEN	
1467 MOVETOLOCATIONSCREEN	1674 MOVETOLOCATIONSCREEN	1963 CHANGELOCATIONSCREEN	2019 DELETEDCOMMANDSCREEN	

FUNCT: FIX	FILE#			
USERS: 801 DOCLAL	910 MOVETORACKINDEX	937 MOVETORACKINDEX	944 MOVETORACKINDEX	
964 MOVETORACKINDEX	983 MOVETORACKINDEX	1296 COMPUTERACKLOCATION	1370 HANDDEFINITIONSCREEN	
1436 GETSCALEDATA	1611 MOVETOLOCATIONSCREEN	1629 MOVETOLOCATIONSCREEN	1638 MOVETOLOCATIONSCREEN	
1650 MOVETOLOCATIONSCREEN	1656 MOVETOLOCATIONSCREEN	1662 MOVETOLOCATIONSCREEN	1668 MOVETOLOCATIONSCREEN	
2301 RANGECHECKEDSPEEDIN	2551 INITZYMATE	2564 INITZYMATE	2577 INITZYMATE	
2635 INITZYMATE	2657 INITZYMATE	2873 INITZYMATE	2886 INITZYMATE	

FUNCT: FLOAT	FILE#			
USERS: 933 MOVETORACKINDEX	933 MOVETORACKINDEX	934 MOVETORACKINDEX	934 MOVETORACKINDEX	
943 MOVETORACKINDEX	1131 RACKSETUPSCREEN	1132 RACKSETUPSCREEN	1133 RACKSETUPSCREEN	
1136 RACKSETUPSCREEN	1168 RACKSETUPSCREEN	1169 RACKSETUPSCREEN	1170 RACKSETUPSCREEN	
1171 RACKSETUPSCREEN	1175 RACKSETUPSCREEN	1209 RACKSETUPSCREEN	1210 RACKSETUPSCREEN	
1211 RACKSETUPSCREEN	1212 RACKSETUPSCREEN	1213 RACKSETUPSCREEN	1214 RACKSETUPSCREEN	
1215 RACKSETUPSCREEN	1246 RACKSETUPSCREEN	1370 HANDDEFINITIONSCREEN	1370 HANDDEFINITIONSCREEN	
1372 HANDDEFINITIONSCREEN	1628 MOVETOLOCATIONSCREEN	1628 MOVETOLOCATIONSCREEN	1637 MOVETOLOCATIONSCREEN	
1643 MOVETOLOCATIONSCREEN	1643 MOVETOLOCATIONSCREEN	1649 MOVETOLOCATIONSCREEN	1649 MOVETOLOCATIONSCREEN	
1655 MOVETOLOCATIONSCREEN	1661 MOVETOLOCATIONSCREEN	1661 MOVETOLOCATIONSCREEN	1667 MOVETOLOCATIONSCREEN	

1876 GETSCALEDNR1	1878 GETSCALEDNR1	1882 GETSCALEDNR1	1884 GETSCALEDNR1
2291 RANGECHECKEDSPEEDIN	2295 RANGECHECKEDSPEEDIN	2297 RANGECHECKEDSPEEDIN	2555 INITZYMATE
2581 INITZYMATE	2620 INITZYMATE	2642 INITZYMATE	2666 INITZYMATE
2693 INITZYMATE	2705 INITZYMATE	2717 INITZYMATE	2729 INITZYMATE
2753 INITZYMATE	2779 INITZYMATE	2785 INITZYMATE	2791 INITZYMATE
2892 INITZYMATE	2905 INITZYMATE		

FUNCT: FREERAM	FILE=		
USERS: 1275 RACKSETUPSCREEN	1309 COMPUTERACKLOCATION	1364 INITZYMATEROBOT	2394 INITZYMATE

FUNCT: GETCHAR	FILE=		
USERS: 272 VALUEENTERED	593 MONUMENTSCREEN	608 MONUMENTSCREEN	1017 RACKSETUPSCREEN

FUNCT: GETRAM	FILE=		
USERS: 995 RACKSETUPSCREEN	1290 COMPUTERACKLOCATION	1338 INITZYMATEROBOT	1355 INITZYMATEROBOT
2497 INITZYMATE	2794 INITZYMATE		

FUNCT: HIGH	FILE=		
USERS: 284 DOPOSITIONCONTROL	286 DOPOSITIONCONTROL	288 DOPOSITIONCONTROL	313 REDOPOSITIONCONTROL
321 REDOPOSITIONCONTROL	323 REDOPOSITIONCONTROL	325 REDOPOSITIONCONTROL	561 MONUMENTSCREEN
2366 INITZYMATE			

FUNCT: IABS	FILE=		
USERS: 144 VIBRATORUNITS	148 VIBRATORUNITS	576 MOVEZYMATE	577 MOVEZYMATE
644 DISPLAYBASEFORCES	655 DISPLAYBASEFORCES	666 DISPLAYBASEFORCES	759 CALCULATEHANDAXISCOUNTS

FUNCT: INPUT	FILE=		
USERS: 421 BASEFKEYS	498 BASEFKEYS	522 HANDFKEYS	584 HANDFKEYS
915 DOWRISTZEROS	952 DOWRISTZEROS		

FUNCT: KEYBOXES	FILE=		
USERS: 351 DISPLAYMAINSCEEN			

FUNCT: LAST	FILE=		
USERS: 206 CLEARKEYBOXES	207 CLEARKEYBOXES	216 CLEARFUNCTIONAREA	220 CLEARFUNCTIONAREA
389 STOPANDREINITROBOT	435 BASECOORDINATESCREEN	474 BASESPEEDSCREEN	518 BASESENSESCREEN
600 UPDTELASTNAME	601 UPDTELASTNAME	602 UPDTELASTNAME	603 UPDTELASTNAME
701 STORECOMMANDVARIABLE	708 MONUMENTSCREEN	722 STOREIMMEDIATECOMMAND	734 PROGRAMMINGCOMMANDSCREEN
982 CALIBRATIONSCREEN	1035 RACKSETUPSCREEN	1068 RACKSETUPSCREEN	1084 WRISTCALIBRATIONSCREEN
1088 WRISTCALIBRATIONSCREEN	1124 RACKSETUPSCREEN	1165 HANDCOORDINATESCREEN	1204 HANDSPEEDSCREEN
1350 HANDDEFINITIONSCREEN	1351 HANDDEFINITIONSCREEN	1373 INITZYMATEROBOT	1465 MOVETOLOCATIONSCREEN
2066 ZYMATEHANDPROGRAMMING	2075 ZYMATEHANDPROGRAMMING	2083 ZYMATEHANDPROGRAMMING	2089 ZYMATEHANDPROGRAMMING
2138 ZYMATEHANDPROGRAMMING	2161 ZYMATEPROGRAMMING	2170 ZYMATEPROGRAMMING	2180 ZYMATEPROGRAMMING
2198 ZYMATEPROGRAMMING	2221 ZYMATEPROGRAMMING	2264 ZYMATEPROGRAMMING	

FUNCT: LOOKUPEXPSYMBOL	FILE=		
USERS: 563 MONUMENTSCREEN	672 MONUMENTSCREEN	1005 RACKSETUPSCREEN	1071 RACKSETUPSCREEN
1296 HANDDEFINITIONSCREEN	1318 HANDDEFINITIONSCREEN	1678 MOVETOLOCATIONSCREEN	1968 CHANGELOCATIONSCREEN
2799 INITZYMATE			

FUNCT: LOW	FILE=		
USERS: 111 GETPOSITION	120 GETPOSITION	129 GETPOSITION	139 GETPOSITION
173 GETPOSITION	283 DOPOSITIONCONTROL	285 DOPOSITIONCONTROL	287 DOPOSITIONCONTROL
314 REDOPOSITIONCONTROL	316 REDOPOSITIONCONTROL	320 REDOPOSITIONCONTROL	322 REDOPOSITIONCONTROL
478 CALCULATEBASEAXISCOUNTS	479 CALCULATEBASEAXISCOUNTS	480 CALCULATEBASEAXISCOUNTS	560 MONUMENTSCREEN
759 CALCULATEHANDAXISCOUNTS	762 CALCULATEHANDAXISCOUNTS	763 CALCULATEHANDAXISCOUNTS	804 DOCL
2365 INITZYMATE			

FUNCT: MOVB	FILE=		
USERS: 670 MONUMENTSCREEN	673 STOREANDCHECKSYMBOL	1078 RACKSETUPSCREEN	1291 COMPUTERACKLOCATION
1374 HANDDEFINITIONSCREEN	1474 MOVETOLOCATIONSCREEN	1482 MOVETOLOCATIONSCREEN	1677 MOVETOLOCATIONSCREEN
1829 MOVETOLOCATIONSCREEN	1834 MOVETOLOCATIONSCREEN	2372 INITZYMATE	2386 INITZYMATE
2865 INITZYMATE			

FUNCT: MOVW	FILE=		
USERS: 785 GETCALIBRATIONDATA	789 GETCALIBRATIONDATA	817 SAVECALIBRATIONDATA	820 SAVECALIBRATIONDATA

FUNCT: NUMOUT	FILE=		
USERS: 1835 MOVETOLOCATIONSCREEN			

FUNCT: REALTOASCII	FILE=		
S: 1830 MOVETOLOCATIONSCREEN			

FUNCT: RECEIVEMESSAGE	FILE=		
USERS: 161 SENDMESSAGEILLGOODSTATUS	1436 STOPPROGRAM	1446 STOPPROGRAM	2419 INITZYMATE

FUNCT: RECEIVEMESSAGETIMEDWAIT	FILE=		
USERS: 412 ZYMATEWAIT	497 BASEFKEYS	583 HANDFKEYS	789 ZYMATEHANDWAIT

1440 STOPPROGRAM 2783 INITZYMATE	2142 ZYMATEHANDPROGRAMMING 2789 INITZYMATE	2266 ZYMATEPROGRAMMING	2618 INITZYMATE
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: RELEASE FILE=
 : 179 SENDMESSAGEITILLGOODSTATUS 359 STOPANDREINITROBOT

FUNCT: SAL FILE=
 USERS: 294 COMPUTEABSOLUTE 295 COMPUTEABSOLUTE 296 COMPUTEABSOLUTE 302 COMPUTERELATIVE
 310 COMPUTEHAND 311 COMPUTEHAND 312 COMPUTEHAND 893 GETDICTIONARYHANDOFFSETS
 895 GETDICTIONARYHANDOFFSETS 1303 HANDDEFINITIONSCREEN 1304 HANDDEFINITIONSCREEN 1305 HANDDEFINITIONSCREEN
 1685 MOVETOLOCATIONSCREEN 1686 MOVETOLOCATIONSCREEN 2804 INITZYMATE 2805 INITZYMATE

FUNCT: SAR FILE=
 USERS: 268 SETABSOLUTE 270 SETABSOLUTE 272 SETABSOLUTE 278 SETRELATIVE
 286 SETHAND 287 SETHAND 288 SETHAND 984 TELLPOSITION
 1012 TELLPOSITION 1028 TELLPOSITION 1035 TELLPOSITION 1052 TELLPOSITION

FUNCT: SENDMESSAGE FILE=
 USERS: 160 SENDMESSAGEITILLGOODSTATUS 256 STOPMONITOR 1445 STOPPROGRAM 2342 RETURNTOEXEC

FUNCT: SHR FILE=
 USERS: 221 DISPLAYCOLLISIONMESSAGE 227 DISPLAYCOLLISIONMESSAGE 245 DISPLAYCOLLISIONMESSAGE 251 DISPLAYCOLLISIONMESSAGE
 2430 INITZYMATE

FUNCT: SIGNED FILE=
 USERS: 111 GETPOSITION 120 GETPOSITION 129 GETPOSITION 139 GETPOSITION
 173 GETPOSITION 805 DOCAL 805 DOCAL 805 DOCAL
 808 DOCAL 891 TOINTEGER 895 TOINTEGER 933 MOVETORACKINDEX
 934 MOVETORACKINDEX 934 MOVETORACKINDEX 935 MOVETORACKINDEX 935 MOVETORACKINDEX
 1212 RACKSETUPSCREEN 1213 RACKSETUPSCREEN 1214 RACKSETUPSCREEN 1215 RACKSETUPSCREEN
 2291 RANGECHECKEDSPEEDIN 2295 RANGECHECKEDSPEEDIN 2297 RANGECHECKEDSPEEDIN 2681 INITZYMATE
 2705 INITZYMATE 2717 INITZYMATE 2729 INITZYMATE 2741 INITZYMATE

FUNCT: SIN FILE=
 USERS: 1135 RACKSETUPSCREEN 1174 RACKSETUPSCREEN 1214 RACKSETUPSCREEN 1372 HANDDEFINITIONSCREEN

: SIZE FILE=
 : 146 SETUPROBOTMESSAGE 441 BASECOORDINATESCREEN 480 BASESPEEDSCREEN 524 BASESENSESCREEN
 676 MONUMENTSCREEN 705 STORECOMMANDVARIABLE 726 STOREIMMEDIATECOMMAND 740 PROGRAMMINGCOMMANDSCREEN
 745 STOREROBOTPOSITION 1171 HANDCOORDINATESCREEN 1210 HANDSPEEDSCREEN 1248 RACKSETUPSCREEN
 1252 HANDSENSESCREEN 1338 INITZYMATEROBOT 1351 INITZYMATEROBOT 1375 HANDDEFINITIONSCREEN
 1412 STOPPROGRAM 1429 STOPPROGRAM 2072 ZYMATEHANDPROGRAMMING 2167 ZYMATEPROGRAMMING
 2383 INITZYMATE

FUNCT: SORT FILE=
 USERS: 941 MOVETORACKINDEX 1132 RACKSETUPSCREEN 1169 RACKSETUPSCREEN 1210 RACKSETUPSCREEN

FUNCT: STOREEXPSYMBOL FILE=
 USERS: 650 MONUMENTSCREEN 674 STOREANDCHECKSYMBOL 701 MONUMENTSCREEN 1256 RACKSETUPSCREEN

FUNCT: STROBECHAR FILE=
 USERS: 412 BASEFKEYS 513 HANDFKEYS 776 DOCAL 839 DOBASEZEROS
 1075 WRISTCALIBRATIONSCREEN 2132 ZYMATEHANDPROGRAMMING 2256 ZYMATEPROGRAMMING 2476 INITZYMATE

FUNCT: STROBEKEYPAD FILE=
 USERS: 383 STOPANDREINITROBOT 386 STOPANDREINITROBOT

FUNCT: TIME FILE=
 USERS: 118 RESETMESSAGEAREAANDUART 122 RESETMESSAGEAREAANDUART 125 RESETMESSAGEAREAANDUART 127 RESETMESSAGEAREAANDUART
 134 RESETMESSAGEAREAANDUART

FUNCT: TYPECHAR FILE=
 USERS: 294 VALUEENTERED 602 MONUMENTSCREEN 631 MONUMENTSCREEN

FUNCT: TYPECRLF FILE=
 USERS: 355 STOPANDREINITROBOT 409 ZYMATEWAIT 786 ZYMATEHANDWAIT 920 MOVETORACKINDEX
 2392 INITZYMATE 2471 INITZYMATE 2487 INITZYMATE 2521 INITZYMATE
 2837 INITZYMATE

FUNCT: TYPEN FILE=
 USFRS: 217 DISPLAYCOLLISIONMESSAGE 223 DISPLAYCOLLISIONMESSAGE 229 DISPLAYCOLLISIONMESSAGE 235 DISPLAYCOLLISIONMESSAGE
 253 DISPLAYCOLLISIONMESSAGE 259 DISPLAYCOLLISIONMESSAGE 287 VALUEENTERED 338 STOPANDREINITROBOT
 381 ZYMATEWAIT 387 ZYMATEWAIT 393 ZYMATEWAIT 399 ZYMATEWAIT
 785 ZYMATEHANDWAIT 919 MOVETORACKINDEX 1303 COMPUTERACKLOCATION 1996 CHANGELOCATIONSCREEN
 2128 ZYMATEHANDPROGRAMMING 2252 ZYMATEPROGRAMMING 2376 INITZYMATE 2391 INITZYMATE
 2457 INITZYMATE 2461 INITZYMATE 2465 INITZYMATE 2469 INITZYMATE
 2520 INITZYMATE 2827 INITZYMATE 2836 INITZYMATE

FUNCT: TYPES FILE=
USERS: 1302 COMPUTERACKLOCATION

FUNCT: UNSIGN FILE=
USERS: 478 CALCULATEBASEAXISCOUNTS 479 CALCULATEBASEAXISCOUNTS 480 CALCULATEBASEAXISCOUNTS 576 MOVEZYMAE
627 DISPLAYCURRENTGRIPFORCE 644 DISPLAYBASEFORCES 655 DISPLAYBASEFORCES 666 DISPLAYBASEFORCES
759 CALCULATEHANDAXISCOUNTS 762 CALCULATEHANDAXISCOUNTS 763 CALCULATEHANDAXISCOUNTS 801 DOCAL
805 DOCAL 805 DOCAL 984 TELLPOSITION 998 TELLPOSITION
1028 TELLPOSITION 1035 TELLPOSITION 1052 TELLPOSITION 1066 TELLPOSITION
1629 MOVETOLOCATIONSSCREEN 1638 MOVETOLOCATIONSSCREEN 1644 MOVETOLOCATIONSSCREEN 1650 MOVETOLOCATIONSSCREEN
1662 MOVETOLOCATIONSSCREEN 1668 MOVETOLOCATIONSSCREEN 2301 RANGECHECKEDSPEEDIN

FUNCT: XLAT FILE=
USERS: 2441 INITZYMAE

**C-DOC
VARIABLE/CONSTANT XREF**

Local/Param/Global Variables/Constants, Function XREF

	(null)	FILE=ORCA1.CC							
DEFIN:	BYTEDATA	56 : 38	56						
	COMMAND	70 : 26	70						
	COMMANDENTRY	46 : 36	46						
	COMMANDMSG	69 : 69							
	COMMANDVARIABLE	41 : 41							
	HANDCOMMAND	27 : 27							
	HANDGEOMETRY	73 : 35	73						
	IMMEDIATECOMMAND	76 : 76							
	MAXTRIES	53 : 53							
	MODULE	45 : 45							
	MODULEDATA	86 : 86							
	MOVEWAIT	30 : 30							
	NORMALWAIT	29 : 29							
	PARM	81 : 81							
	RACKCOMMAND	30 : 30							
	RACKCOMMANDENTRY	29 : 29							
	RACKINDEX	46 : 46							
	REALDATA	58 : 40	58						
	RETURNDATA	72 : 72							
	TIMER0	25 : 25							
	TIMER1	26 : 26							
	TIMER2	27 : 27							
	TIMERCMD	28 : 28							
	UARTOFFSET	25 : 24	25						
	VARIABLECOMMAND	71 : 71							
	VARIABLEDATA	42 : 42							
	WORDDATA	57 : 39	57						
	WORKINGRAMSIZE	43 : 43							
	ZYMATEPLACE	44 : 44							
GLOBL:	..COMMAND	67 : 67							
	..COMMANDCODE	39 : 39							
	..DESTINATIONID	61 : 61							
	..EXCHANGEID	53 : 53							
	..EXCHANGELINK	58 : 58							
	..HOMEID	65 : 65							
	..LENGTH	63 : 63	78						
	..LINK	62 : 62							
	..MESSAGEHEAD	54 : 54							
	..MESSAGETAIL	55 : 55							
	..MODULEID	38 : 38							
	..PTR	79 : 79							
	..RESPONSEID	66 : 66							
	..TASKHEAD	56 : 56							
	..TASKTAIL	57 : 57							
	..TYPE	64 : 64							
	A	49 : 49							
	ACCESSPTR	0 : 38	39	40	56	57	58	86	
	AH	0 : 27							
	ANGLECOUNTS	31 : 31							
	ANGLEMESSAGE	35 : 35							
	AXISERROR	54 : 54							
	AXISFORCE	74 : 74							
	BASEAXIS1POS	46 : 46							
	BASEAXIS2POS	45 : 45							
	BASEAXIS3POS	44 : 44							
	BASEFORCEACTIVE	47 : 47							
	BH	0 : 28							
	BLINKSCLEARED	43 : 43							
	BUFFER	95 : 95							
	CAL	98 : 98							
	CALWARNING	41 : 41							
	CHECKSUM	51 : 51							
	COL	47 : 47							
	COMMANDCODE	90 : 90							
	COMMANDEXCHANGE	59 : 59							
	COMMANDMSGPTR	68 : 68	69						
	COMMANDPTR	0 : 26	27	70	71	72	76		
	COMMANDTABLE	93 : 93							
	COMMANDTYPE	89 : 89							
	CURRENTHANDHEIGHTOFFSET	34 : 34							
	CURRENTHANDLATERALOFFSET	32 : 32							
	CURRENTHANDREACHOFFSET	33 : 33							
	DUMMYCODE	62 : 62							

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FUNCT: BASECOORDINATESCREEN      FILE=ORCA1.CC
GLOBL: CHAR                        0 : 441
ZPCASE                            0 : 434 435 437 438 441 443
LOCAL: ZPKEYS                     426 : 426 435 441 441

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[illegible]

.....					
FUNCT: CHANGELocationsSCREEN		FILE=ORCA1.CC				
DEFIN:	COMMAND	0 :	1970	1970	1972	1977
	COMMANDENTRY	0 :	1963	1964	1969	1969 1970
GLOBL:	ABSOLUTESIGN	0 :	1980			
	COMMANDCODE	0 :	1970	1970	1977	
	COMMANDPTR	0 :	1969			
	ENTRYNOTFOUNDMESSAGE	0 :	2007			
	HANDSIGN	0 :	1988			
	MODULEID	0 :	1972			
	MYMODULEID	0 :	1972			
	NAME	0 :	1969			
	NAMEFORMAT	0 :	1963			
	NAMELENGTH	0 :	1963	1964	1969	
	RAMPTR	0 :	1968	1992		

RELATIVESIGN	0 : 1984								
RESPONSE	0 : 1968	1970	1992	1994					
TYPE	0 : 1970								

FUNCT: CLEARFUNCTIONAREA	FILE=ORCA1.CC								
GLOBL: I	0 : 214	214	214	216	218	218	218	220	
SPACES	0 : 216	216	220	220					

FUNCT: CLEARKEYBOXES	FILE=ORCA1.CC								
GLOBL: I	0 : 204	204	204	204	206	207			
SPACES	0 : 206	206	207	207					

FUNCT: CLEARNAMEAREA	FILE=ORCA1.CC								
GLOBL: SPACES	0 : 227	227	228	228					

FUNCT: COMMUNICATEWITHROBOT	FILE=ORCA3.CC								
GLOBL: BYTESIN	0 : 242								
BYTESOUT	0 : 231	242	242	242					
CHECKSUM	0 : 242								
KEYPADSTATUS	0 : 236								
ROBOTMESSAGE	0 : 231	238	242	242	242	242	242		
ROBOTSTATUS	0 : 232	233	241	244					
TEXT	0 : 238	242							

FUNCT: COMPUTEABSOLUTE	FILE=ORCA2.CC								
DEFIN: COMMAND	0 : 294	295	296						
GLOBL: ANGLE	0 : 296								
HEIGHT	0 : 294								
PENDINGANGLE	0 : 296								
PENDINGHEIGHT	0 : 294								
PENDINGREACH	0 : 295								
REACH	0 : 295								
REFANGLE	0 : 296								
REFHEIGHT	0 : 294								
REFREACH	0 : 295								

FI : COMPUTECHECKSUM	FILE=ORCA3.CC								
: CHECKSUM	0 : 196	199	199	201	201	202			
ROBOTMESSAGE	0 : 199	202							
TEXT	0 : 199	202							
PARAM: INDEX	193 : 192	193	197	202					
LOCAL: I	195 : 195	197	197	197	199				

FUNCT: COMPUTEHAND	FILE=ORCA2.CC								
DEFIN: HANDCOMMAND	0 : 310	311	312						
GLOBL: GRIP	0 : 311								
PENDINGGRIP	0 : 311								
PENDINGSYRINGE	0 : 312								
PENDINGWRIST	0 : 310								
SYRINGE	0 : 312								
WRIST	0 : 310								

FUNCT: COMPUTERACKLOCATION	FILE=ORCA2.CC								
DEFIN: RACKCOMMAND	0 : 1284	1284	1284	1284	1284	1284	1284	1291	1291
RACKINDEX	0 : 1291	1292	1295	1295	1302				
REALDATA	0 : 1296								
GLOBL: ABORT	0 : 1305								
ACCESSPTR	0 : 1295								
COL	0 : 1284								
COMMANDMODF	0 : 1300								
COMMANDPTR	0 : 1281								
DXC	0 : 1284								
DXR	0 : 1284								
DYC	0 : 1284								
DYR	0 : 1284								
DZC	0 : 1284								
DZR	0 : 1284								
NAME	0 : 1295								
NAMELENGTH	0 : 1291	1295	1302						
NAMES	0 : 1291	1291							
RACKCOMMANDPTR	0 : 1281								
RACKINDEXPTR	0 : 1290	1309							
RESPONSE	0 : 1292	1293							

FUNCT: COMPUTERELATIVE	FILE=ORCA2.CC								
DEFIN: COMMAND	0 : 302	303	304						
GLOBL: ANGLE	0 : 304								
HEIGHT	0 : 302								

[illegible]

LOC	ROW	768	767	768	780
TEMPCALFACTOR	775	775	804	805	807
FUNCT: DOPOSITIONCONTROL	FILE=ORCA3.CC				
GLOBL: BASEAXIS1POS	0 : 270				
BASEAXIS2POS	0 : 271				
BASEAXIS3POS	0 : 272				
ROBOTCOMMANDCODE	0 : 269	276	282		
ROBOTMESSAGE	0 : 283	284	285	286	287
TEXT	0 : 283	284	285	286	287
WRISTAXIS1POS	0 : 277				
WRISTAXIS2POS	0 : 278				
WRISTAXIS3POS	0 : 279				
PARAM: AXIS1POS	263 : 261	263	270	277	283
AXIS2POS	264 : 261	264	271	278	285
AXIS3POS	265 : 261	265	272	279	287
PORTADDR	262 : 261	262	267		
FUNCT: DOWRISTZEROS	FILE=ORCA1.CC				
GLOBL: CAL	0 : 949				
CALFACTOR.GRIPZERO	0 : 932	932	936	936	
CALFACTOR.SYRINGEZERO	0 : 924	924	928	928	
CALFACTOR.WRISTZERO	0 : 940	940	944	944	
DUMMYPTR	0 : 951				
LOCAL: CHAR	904 : 904	906	907	909	911
FKEY	905 : 905	915	918	921	921
FUNCT: FORCEUPPER	FILE=ORCA2.CC				
PARAM: CHAR	395 : 394	395	397	397	403
FUNCT: GETBASEFORCEVALUES	FILE=ORCA3.CC				
GLOBL: ANGLEFORCE	0 : 921				
BASESTATUS	0 : 927				
HEIGHTFORCE	0 : 922				
RDIR	0 : 926				
REACH	0 : 926				
REACHFORCE	0 : 923	926	926		
ROBOTMESSAGE	0 : 921	922	923	927	
TEXT	0 : 921	922	923	927	
FUNCT: GETCALIBRATIONDATA	FILE=ORCA2.CC				
GLOBL: CALFACTOR.ANGLE	0 : 786				
CALFACTOR.HEIGHT	0 : 785				
CALFACTOR.WRIST	0 : 789				
ROBOTMESSAGE	0 : 781	785	789		
TEXT	0 : 781	785	789		
FUNCT: GETDICTIONARYHANDOFFSETS	FILE=ORCA2.CC				
DEFIN: HANDGEOMETRY	0 : 893	894	895		
GLOBL: CURRENTHANDHEIGHTOFFSET	0 : 893				
CURRENTHANDLATERALOFFSET	0 : 895				
CURRENTHANDREACHOFFSET	0 : 894				
HEIGHTADDON	0 : 893				
REACHADDON	0 : 894				
SIDEADDON	0 : 895				
FUNCT: GETPOSITION	FILE=ORCA2.CC				
GLOBL: A	0 : 105	111	137	139	143
ANGLE	0 : 107	111			
B	0 : 114	120	146	152	
C	0 : 123	129	167	173	
CALFACTOR.ANGLE	0 : 111				
CALFACTOR.ANGLEZERO	0 : 105	111			
CALFACTOR.GRIP	0 : 173				
CALFACTOR.GRIPZERO	0 : 167	173			
CALFACTOR.HEIGHT	0 : 120				
CALFACTOR.HEIGHTZERO	0 : 114	120			
CALFACTOR.REACH	0 : 129				
CALFACTOR.REACHZERO	0 : 123	129			
CALFACTOR.SYRINGE	0 : 152				
CALFACTOR.SYRINGEZERO	0 : 146	152			
CALFACTOR.WRIST	0 : 139	143			
CALFACTOR.WRISTZERO	0 : 137	139	143		
GRIP	0 : 169	173	176	178	182
HEIGHT	0 : 116	120			
PENDINGGRIP	0 : 178				
PENDINGSYRINGE	0 : 157				
REACH	0 : 125	129			

[illegible]

[illegible]

FUNCT: INITZYMATEROBOT	FILE=ORCA2.CC			
GOBL: ANGLE	0 : 1387	1398		
ANGLESPEED	0 : 1379			
CODESEG	0 : 1358			
CURRENTHANDHEIGHTOFFSET	0 : 1371			
CURRENTHANDLATERALOFFSET	0 : 1371			
CURRENTHANDNAME	0 : 1372			
CURRENTHANDREACHOFFSET	0 : 1371			
CURRENTNAME	0 : 1373	1375	1377	
DATASIZE	0 : 1360			
GRIP	0 : 1393			
GRIPSPEED	0 : 1384			
HEIGHT	0 : 1389	1396		
HEIGHTSPEED	0 : 1380			
I	0 : 1373	1373	1373	1375
INITIALIP	0 : 1359			
MODULEID	0 : 1357			
MODULENAME	0 : 1356			
MYMODULEID	0 : 1348	1357		
PENDINGANGLE	0 : 1387			
PENDINGGRIP	0 : 1393			
PENDINGHEIGHT	0 : 1389			
PENDINGREACH	0 : 1388			
PENDINGSYRINGE	0 : 1393			
PENDINGWRIST	0 : 1392			
PRIORITY	0 : 1362			
RDIR	0 : 1399			
REACH	0 : 1388	1397		
REACHSPEED	0 : 1381			
REFANGLE	0 : 1398			

[illegible]

	AXIS2ACCEL	191 : 176	181	185													
	AXIS2SPEED	178 : 176	178	185													
	AXIS3ACCEL	182 : 176	182	185													
	AXIS3SPEED	179 : 176	179	185													

FUNCT:	MONUMENTSCREEN	FILE=ORCA1.CC															
DEFIN:	COMMAND	0 :	676	680	681	686	686										
	COMMANENTRY	0 :	558	559	560	561	562	567	581	582	583	583	588	644	645	647	647
GLOBL:	ABBREV	0 :	583	677													
	CHAR	0 :	590	591	593	594	594	598	600	602	605	606	608	609	613	619	625
	COMMANDCODE	0 :	681	686													
	COMMANDPTR	0 :	671	685													
	DUMMYPTR	0 :	567														
	FORMAT	0 :	582	679													
	G	0 :	635														
	LENGTH	0 :	647	676													
	MODULEID	0 :	680	686													
	MVMODULEID	0 :	560	561	680	686											
	NAME	0 :	559	560	561	562	567	588	644	645	647	670	670	671	685		
	NAMIFORMAT	0 :	588														
	NAMELENGTH	0 :	558	583	670	671	676	677	685								
	RAMPTR	0 :	563	571	650	654	672	701	705								
	RESPONSE	0 :	563	565	567	568	571	650	654	657	672	673	701	705	709		
	SPACES	0 :	554	554	708	708											
	TYPE	0 :	581	678													
LOCAL:	NEWMONUMENT	550 :	550	557	570	576	579	641	648	675	693	699					
	NEWNAME	549 :	549	615	621	641											

FUNCT:	MOVEHAND	FILE=ORCA3.CC															
GLOBL:	GRIP	0 :	839														
	GRIPCOUNTS	0 :	836														
	PENDINGGRIP	0 :	839														
	PENDINGSYRINGE	0 :	838														
	PENDINGWRIST	0 :	837														
	SYRINGE	0 :	838														
	SYRINGECOUNTS	0 :	836														
	WRIST	0 :	837														
	WRISTCOUNTS	0 :	836														
% :	WAITTYPE	829 :	828	829	832												

FUNCT:	MOVEHANDTILLACKNOWLEDGE	FILE=ORCA2.CC															
GLOBL:	CHAR	0 :	873	874	874												

FUNCT:	MOVETOCOORDINATESCREEN	FILE=ORCA1.CC															
GLOBL:	BUFFER	0 :	1897	1906	1915	1924	1933	1942									
	FIRSTDISPLAY	0 :	1955														
I		0 :	1951	1951	1951	1953											
	PENDINGANGLE	0 :	1920														
	PENDINGGRIP	0 :	1938														
	PENDINGHEIGHT	0 :	1902														
	PENDINGREACH	0 :	1911														
	PENDINGSYRINGE	0 :	1947														
	PENDINGWRIST	0 :	1929														

FUNCT:	MOVETOLOCATIONSCREEN	FILE=ORCA1.CC															
DEFIN:	COMMAND	0 :	1484	1484	1484	1486	1486	1491	1491	1491	1491	1516	1516	1516	1516	1526	1527
	COMMANENTRY	0 :	1467	1468	1474	1474	1479	1483	1483	1674	1675	1677	1677	1679	1679	1742	1742
	ZYMATEPLACE	0 :	1484														
GLOBL:	ABSOLUTE SIGN	0 :	1535														
	ANGLE	0 :	1686	1698													
	ANGLESPEED	0 :	1632	1633	1639	1645	1650	1651									
	AXISFORCE	0 :	1600	1603	1620	1623											
	BUFFER	0 :	1497														
	COMMANDCODE	0 :	1484	1484	1486	1486	1491	1491	1491	1491	1516	1516	1516	1516	1526	1527	1529
	COMMANDPTR	0 :	1483	1679	1739												
	CURRENTHANDNAME	0 :	1742														
	CURRENTNAME	0 :	1474	1677	1829	1830	1834	1835	1836	1839	1841						
	CURRENTNAMETYPE	0 :	1477	1493	1699	1825	1827										
	DIRECTPATH	0 :	1718	1721													
	ENTRYNOTFOUNDMESSAGE	0 :	1851														
	FIRSTDISPLAY	0 :	1823														
	GRIPACCEL	0 :	1657														

I	0	: 1731	1731	1735	1735	1765	1765	1765	1767	1772	1772	1772	1774
MODULEID	0	: 1484	1680										
MOVEMENTCOMMAND	0	: 1478	1522	1537	1543	1549	1558	1761					
MYMODULEID	0	: 1484	1680										
NAME	0	: 1483	1679										
NAMEFORMAT	0	: 1467	1674										
NAMELENGTH	0	: 1467	1468	1474	1474	1479	1483	1674	1675	1677	1677	1679	1742 1742
NUMBER	0	: 1554	1835										
OUTPUTVOLTAGE	0	: 1619	1620										
PENDINGANGLE	0	: 1592	1698										
PENDINGGRIP	0	: 1572	1753										
PENDINGHEIGHT	0	: 1582	1696										
PENDINGREACH	0	: 1587	1697										
PENDINGSYRINGE	0	: 1577	1758										
PENDINGWRIST	0	: 1567	1748										
POSITIONTYPE	0	: 1724	1727										
RAMPTR	0	: 1482	1678										
REACH	0	: 1685	1697										
REACHACCEL	0	: 1633	1639	1645	1651								
REACHSPEED	0	: 1631	1633	1639	1644	1645	1651						
REACHTRANSOFFSET	0	: 1633	1639	1645	1651								
REFANGLE	0	: 1686											
REFHEIGHT	0	: 1684											
REFREACH	0	: 1685											
RELATIVESIGN	0	: 1541											
RESPONSE	0	: 1479	1480	1678	1680								
RN1	0	: 1497	1504	1506	1510	1512	1516	1518	1518	1611	1629	1638	1644 1650 1656 1662
ROBOTMESSAGE	0	: 1603	1613	1623									
ROBOTSPEED	0	: 1629	1630	1631	1632								
ROTARYACCEL	0	: 1633	1639	1645	1651								
ROTARYTRANSOFFSET	0	: 1633	1639	1645	1651								
SETABSWARNING	0	: 1703	1711										
SPACES	0	: 1465	1465	1466	1466								
SYRINGEACCEL	0	: 1657	1663	1669									
SYRINGESPEED	0	: 1657	1663	1668	1669								
TEXT	0	: 1603	1613	1623									
TYPE	0	: 1484											
VERTICALACCEL	0	: 1633	1639	1645	1651								
VERTICALTRANSOFFSET	0	: 1633	1639	1645	1651								
VIBRATORSPEED	0	: 1611	1613										
WRISTACCEL	0	: 1657	1663	1669									
WRISTSPEED	0	: 1656	1657	1663	1669								
LOCAL: CODE	1462	: 1462	1526	1777	1777	1777	1777	1780	1782	1806			
DICSYPTR	1463	: 1463	1479	1482									
INT	1461	: 1461											

FUNCT: MOVETORACKINDEX	FILE=ORCA2.CC																	
DEFIN: RACKCOMMAND	0	: 907	908	910	915	915	930	931	933	933	933	934	934	934	935	935		
GLOBL: A	0	: 943	944	983														
ABORT	0	: 921																
COL	0	: 915	930	931	931	933	934	935										
COMMANDMODE	0	: 917																
CURRENTHANDHEIGHTOFFSET	0	: 910	937															
CURRENTHANDLATERALOFFSET	0	: 943																
CURRENTHANDREACHOFFSET	0	: 944																
DXC	0	: 933																
DXR	0	: 933																
DYC	0	: 934																
DYR	0	: 934																
DZC	0	: 935																
DZR	0	: 935																
INDEXWARNING	0	: 919	925															
PENDINGANGLE	0	: 950	955	964	971	976	983	983	984	986								
PENDINGHEIGHT	0	: 910	937															
PENDINGREACH	0	: 944																
RN1	0	: 907	933	941	941	942	945	962										
RN2	0	: 908	934	941	941	942	948	969										
RN3	0	: 935	937															
RN4	0	: 941	943	944														
RN5	0	: 942	950	955	964													
ROW	0	: 915	930	931	933	934	935											
X1	0	: 907	933															
Y1	0	: 908	934															
Z1	0	: 910	935															
PARAM: INDEX	900	: 899	900	904	915	915	930	931										

FUNCT: MOVEZYMAE	FILE=ORCA3.CC	
GLOBL: ANGLE	0	: 576 682

[illegible]

[illegible]

```

-----
F:  - RESTOREPOSITION          FILE=ORCA1.CC
G:  : ANGLE                    0 : 1861
    : FIRSTDISPLAY             0 : 1865
    : GRIP                     0 : 1863
    : HEIGHT                   0 : 1859
    : PENDINGANGLE             0 : 1861
    : PENDINGGRIP              0 : 1863
    : PENDINGHEIGHT            0 : 1859
    : PENDINGREACH             0 : 1860
    : PENDINGSYRINGE           0 : 1864
    : PENDINGWRIST             0 : 1862
    : REACH                    0 : 1860
    : SYRINGE                   0 : 1864
    : WRIST                     0 : 1862
-----

```

```

-----
FUNCT: RETURNCHECKSUMOK      FILE=ORCA3.CC
GLOBL: I                     0 : 212  212  212  214
    : ROBOTMESSAGE           0 : 214  216
    : TEXT                   0 : 214  216
PARAM: BUFFERINDEX           207 : 206  207  212
    : CHECKSUMINDEX          208 : 206  208  212  216
LOCAL: RETURNCHECK           210 : 210  211  214  214  216
-----

```

```

-----
FUNCT: RETURNTOEXEC          FILE=ORCA1.CC
DEFIN: COMMAND               0 : 2340
    : COMMANDMSG             0 : 2342
GLOBL: ABORT                  0 : 2338
    : COMMANDCODE            0 : 2340
    : COMMANDMSGPTR          0 : 2342
    : RESPONSEID             0 : 2342
-----

```

```

-----
FUNCT: SAVECALIBRATIONDATA   FILE=ORCA2.CC
GLOBL: CALFACTOR.HEIGHT      0 : 817
    : CALFACTOR.WRIST        0 : 820
    : ROBOTMESSAGE           0 : 817  820
    : TEXT                   0 : 817  820
-----

```

```

-----
I:  : SENDMESSAGE TILLGOODSTATUS  FILE=ORCA3.CC
GLOBL: J                     0 : 174  175
    : KEYPADSTATUS           0 : 162  171  171
    : MESSAGEPTR             0 : 161
    : MYMODULEID             0 : 179
    : NAMEFORMAT             0 : 173
    : RETURNCODE             0 : 162  174
    : RETURNEXCHANGE.EXCHANGEID 0 : 161
    : ROBOTMESSAGE           0 : 160  162  174
LOCAL: GOOD                   155 : 155  157  158  185
    : TRIES                   154 : 154  156  164  164  165  169
-----

```

```

-----
FUNCT: SETABSOLUTE           FILE=ORCA2.CC
DEFIN: COMMAND               0 : 268  270  272
GLOBL: ANGLE                 0 : 271  272  272
    : HEIGHT                 0 : 267  268  268
    : REACH                   0 : 269  270  270
    : REFANGLE               0 : 271
    : REFHEIGHT              0 : 267
    : REFREACH               0 : 269
-----

```

```

-----
FUNCT: SETFACTORYCAL         FILE=ORCA2.CC
GLOBL: CALFACTOR.ANGLE       0 : 832
    : CALFACTOR.ANGLEZERO    0 : 835
    : CALFACTOR.GRIP         0 : 844
    : CALFACTOR.GRIPZERO     0 : 847
    : CALFACTOR.HEIGHT       0 : 830
    : CALFACTOR.HEIGHTZERO   0 : 833
    : CALFACTOR.REACH        0 : 831
    : CALFACTOR.REACHZERO    0 : 834
    : CALFACTOR.SYRINGE      0 : 845
    : CALFACTOR.SYRINGEZERO  0 : 848
    : CALFACTOR.WRIST        0 : 843
    : CALFACTOR.WRISTZERO    0 : 846
I:  : AXISID                 826 : 825  826  828  828  836  841  841  849
-----

```

```

-----
FUNCT: SETHAND               FILE=ORCA2.CC
DEFIN: HANDCOMMAND           0 : 286  287  288
GLOBL: GRIP                  0 : 287  287
    : SYRINGE                 0 : 288  288
-----

```

WRIST	0 : 286	286													

FILE: SETRELATIVE	FILE=ORCA2.CC														
GLOBAL: COMMAND	0 : 278	279	280												
GLOBAL: ANGLE	0 : 280	280													
GLOBAL: HEIGHT	0 : 278	278													
GLOBAL: REACH	0 : 279	279													
GLOBAL: REFANGLE	0 : 280														
GLOBAL: REFHEIGHT	0 : 278														
GLOBAL: REFREACH	0 : 279														

FUNCTION: SETUPROBOTMESSAGE	FILE=ORCA3.CC														
GLOBAL: BYTESIN	0 : 145														
GLOBAL: BYTESOUT	0 : 144														
GLOBAL: LENGTH	0 : 146														
GLOBAL: ROBOTMESSAGE	0 : 144	145	146	146	147	148									
GLOBAL: TEXT	0 : 147	148													
PARAM: COMMAND	142 : 139	142	148												
PARAM: DATABYTESIN	141 : 139	141	145	146											
PARAM: DATABYTESOUT	140 : 139	140	144	146	147										

FUNCTION: STOPANDREINITROBOT	FILE=ORCA2.CC														
GLOBAL: ABORT	0 : 365														
GLOBAL: ANGLE	0 : 366														
GLOBAL: BASESTATUS	0 : 377	377													
GLOBAL: CHAR	0 : 383	384	386												
GLOBAL: COMMANDMODE	0 : 336	353	370	381											
GLOBAL: FIRSTDISPLAY	0 : 372														
GLOBAL: HEIGHT	0 : 367														
GLOBAL: KEYMESSAGE	0 : 352														
GLOBAL: KEYPADSTATUS	0 : 332	332	357	363	388	388									
GLOBAL: MOVING	0 : 348														
GLOBAL: MYMODULEID	0 : 359														
GLOBAL: PENDINGANGLE	0 : 366														
GLOBAL: PENDINGHEIGHT	0 : 367														
GLOBAL: PENDINGREACH	0 : 368														
GLOBAL: PENDINGWRIST	0 : 369														
GLOBAL: REACH	0 : 368														
GLOBAL: SPACES	0 : 389	389													
GLOBAL: STOPKEYPRESSED	0 : 334	376													
GLOBAL: STOPPEDMESSAGE	0 : 338	342													
GLOBAL: WRIST	0 : 369														
PARAM: WRISTSTATUS	0 : 378	378													
PARAM: AXISID	330 : 329	330	349												

FUNCTION: STOPMONITOR	FILE=ORCA3.CC														
GLOBAL: MOVING	0 : 252														
GLOBAL: STOPEXCHANGE.EXCHANGEID	0 : 256														
GLOBAL: STOPMONITORACTIVE	0 : 253	255													
GLOBAL: STOPTASKMESSAGE	0 : 256														

FUNCTION: STOPPROGRAM	FILE=ORCA2.CC														
DEFIN: WORDDATA	0 : 1425	1426													
GLOBAL: BYTESIN	0 : 1428														
GLOBAL: BYTESOUT	0 : 1427														
GLOBAL: CHANNELMESSAGEDESCRIPTOR	0 : 1409														
GLOBAL: CHANNELPTR	0 : 1424														
GLOBAL: CONTROLIMAGE	0 : 1422														
GLOBAL: DESTINATIONID	0 : 1414														
GLOBAL: HOMEID	0 : 1413														
GLOBAL: KEYPADSTATUS	0 : 1442														
GLOBAL: LENGTH	0 : 1429														
GLOBAL: MAXRXWAIT	0 : 1417														
GLOBAL: MAXTXWAIT	0 : 1418														
GLOBAL: MOVING	0 : 1438	1442	1448												
GLOBAL: MYMODULEID	0 : 1413														
GLOBAL: POSTTERMCHARS	0 : 1421														
GLOBAL: RESPONSEID	0 : 1415														
GLOBAL: STOPEXCHANGE.EXCHANGEID	0 : 1415	1436	1446												
GLOBAL: STOPKEYPRESSED	0 : 1447														
GLOBAL: STOPMESSAGE	0 : 1412	1413	1414	1415	1416	1417	1418	1419	1420	1421	1422	1424	1427	1428	1429
GLOBAL: STOPMONITORACTIVE	0 : 1451														
GLOBAL: TERMCHAR1	0 : 1419														
GLOBAL: TERMCHAR2	0 : 1420														
GLOBAL: TEXT	0 : 1430	1431	1432	1433											
GLOBAL: TYPE	0 : 1416														
LOCAL: ACCESSPTR	1410 : 1410	1424													
LOCAL: COUNTER	1407 : 1407	1437	1438	1441	1441										

	MESSAGEPTR	1408 : 1408	1436	1440	1446							
	STOPMESSAGEPTR	1409 : 1409	1412									
<hr/>												
I :	STOREANDCHECKSYMBOL	FILE=ORCA2.CC										
J :	COMMANDENTRY	0 : 673	673									
GLOBL :	CURRENTNAME	0 : 673										
	NAMELLENGTH	0 : 673	673									
	RAMPTR	0 : 674										
	RESPONSE	0 : 674	675	681								
<hr/>												
FUNCT :	STORECOMMANDVARIABLE	FILE=ORCA2.CC										
DEFIN :	COMMANDVARIABLE	0 : 702	703	705	705	705	706	707	708	708	709	709
	VARIABLEDATA	0 : 710	711									
GLOBL :	ABBREV	0 : 708										
	FORMAT	0 : 707										
	LENGTH	0 : 705										
	MODULEID	0 : 710										
	MYMODULEID	0 : 710										
	NAME	0 : 709										
	NAMELLENGTH	0 : 702	703	705	708	709						
	SPACES	0 : 701	701									
	TYPE	0 : 706										
	VARIABLEDATAPTR	0 : 709										
PARAM :	COL	697 : 695	697	702								
	COMMANDCODE	698 : 695	698	711	711							
	FORMATCODE	699 : 695	699	707								
	ROW	696 : 695	696	702								
<hr/>												
FUNCT :	STOREIMMEDIATECOMMAND	FILE=ORCA2.CC										
DEFIN :	COMMAND	0 : 731	732									
	COMMANDENTRY	0 : 723	724	726	726	726	727	728	729	729	730	730
GLOBL :	ABBREV	0 : 729										
	COMMANDPTR	0 : 730										
	FORMAT	0 : 728										
	LENGTH	0 : 726										
	MODULEID	0 : 731										
	MYMODULEID	0 : 731										
	NAME	0 : 730										
	NAMELLENGTH	0 : 723	724	726	729	730						
	SPACES	0 : 722	722									
	TYPE	0 : 727										
PARAM :	COL	719 : 717	719	723								
	COMMANDCODE	720 : 717	720	732	732							
	ROW	718 : 717	718	723								
<hr/>												
FUNCT :	STOREROBOTPOSITION	FILE=ORCA2.CC										
DEFIN :	COMMAND	0 : 745	750	751								
	COMMANDENTRY	0 : 742	743	745	745	745	746	747	748	748	749	749
GLOBL :	ABBREV	0 : 748										
	ABSOLUTESIGN	0 : 762										
	COMMANDPTR	0 : 749										
	FORMAT	0 : 747										
	HANDSIGN	0 : 754										
	LENGTH	0 : 745										
	MODULEID	0 : 750										
	MYMODULEID	0 : 750										
	NAME	0 : 749										
	NAMEFORMAT	0 : 742										
	NAMELLENGTH	0 : 742	743	745	748	749						
	RELATIVESIGN	0 : 767										
	TYPE	0 : 746										
PARAM :	COMMANDCODE	739 : 738	739	751	751	752	759					
<hr/>												
FUNCT :	TELLPOSITION	FILE=ORCA3.CC										
GLOBL :	ANGLE	0 : 1003										
	FIRSTDISPLAY	0 : 975	989	1003	1017	1043	1057	1071				
	GRIP	0 : 1043										
	HEIGHT	0 : 975										
	PENDINGANGLE	0 : 1003	1005	1012								
	PENDINGGRIP	0 : 1043	1045	1052								
	PENDINGHEIGHT	0 : 975	977	984								
	PENDINGREACH	0 : 989	991	998								
	PENDINGSYRINGE	0 : 1057	1059	1066								
	PENDINGWRIST	0 : 1017	1019	1019	1025	1028	1035					
	REACH	0 : 989										
	SYRINGE	0 : 1057										
	THREEDIGITFORMAT	0 : 1013										
	TWODIGITFORMAT	0 : 985	999									

WRIST NUMBER	0 : 1017 972 : 972	984	985	998	999	1012	1013	1028	1029	1035	1036	1052	1053	1066	1067

T: TESTHANDPOSITION	FILE=ORCA3.CC														
L: PENDINGGRIP	0 : 713	715	719	721											
PENDINGSYRINGE	0 : 701	703	707	709											
PENDINGWRIST	0 : 689	691	695	697											

FUNCT: TESTNEWFORPENDING	FILE=ORCA1.CC														
DEFIN: VARIABLECOMMAND	0 : 2324	2326	2326												
GOBL: MOVEMENTCOMMAND	0 : 2330														
VALUE	0 : 2324	2326	2326												

FUNCT: TESTZYMATEPOSITION	FILE=ORCA3.CC														
GOBL: PENDINGANGLE	0 : 436	438	442	444											
PENDINGHEIGHT	0 : 448	450	454	456											
PENDINGREACH	0 : 460	462	466	468											

FUNCT: TOINTEGER	FILE=ORCA3.CC														
PARAM: BYTEIN	887 : 886	887	889	891	895										

FUNCT: UPDATELASTNAME	FILE=ORCA2.CC														
GOBL: CURRENTNAME	0 : 598	604	605	607	609										
CURRENTNAMETYPE	0 : 610														
I	0 : 605	605	605	607											
SPACES	0 : 600	600	601	601	602	602	603	603							

FUNCT: VALUEENTERED	FILE=ORCA1.CC														
GOBL: BUFFER	0 : 275	286	292	304											
CHAR	0 : 269	270	272	273	279	279	279	279	279	292	294	295	300		
I	0 : 269	279	281	284	284	284	286	290	292	293	293	300	303	303	304
PARAM: BUFFERWIDTH	265 : 262	265	279	284											
COL	264 : 262	264	268	283	289										
ROW	263 : 262	263	268	283	289										

F: VIBRATORUNITS	FILE=ORCA1.CC														
P: VIBRATORSPEED	141 : 140	141	144	148	153										
LOCAL: UNITS	143 : 143	148	149	151	155	155	158								

FUNCT: WRISTCALIBRATIONSCREEN	FILE=ORCA1.CC														
GOBL: ACCESSPTR	0 : 1123														
C	0 : 1070														
CAL	0 : 1066	1143													
CALFACTOR.GRIP	0 : 1085	1113													
CALFACTOR.GRIPZERO	0 : 1116														
CALFACTOR.SYRINGE	0 : 1087	1112													
CALFACTOR.SYRINGEZERO	0 : 1115														
CALFACTOR.WRIST	0 : 1083	1111													
CALFACTOR.WRISTZERO	0 : 1114														
CHAR	0 : 1072	1073	1073	1073	1073	1075	1076	1081	1092	1106					
F	0 : 1071														

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FUNCT: ZYMATEHANDWAIT      FILE=ORCA3.CC
G'  ABORT                  0 : 801
    AXISERROR              0 : 771  772  779  794  803
    DUMMYPTR               0 : 789
    MAXRXWAIT              0 : 775  777
    MOVING                 0 : 778
    ROBOTMESSAGE           0 : 775  777  780  791
    TEXT                   0 : 780  791
    WRISTSTATUS            0 : 780  781  783  787  791  798
LOCAL: HOLDMMSG            770 : 770  785

```

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FUNCT: ZYMATEPROGRAMMING   FILE=ORCA1.CC
GLOBL: ANGESPEED           0 : 2171
      BASEPAGE             0 : 2150  2161  2164  2172  2239  2246
      CHAR                 0 : 2167  2253  2254  2256  2257  2259
      DUMMYPTR             0 : 2266
      FIRSTDISPLAY         0 : 2156
      HEIGHTSPEED         0 : 2171
      MAINMESSAGE          0 : 2241
      PRESSREMESSAGE       0 : 2251
      REACHACCEL           0 : 2171
      REACHSPEED           0 : 2171
      REACHTRANSOFFSET     0 : 2171
      ROTARYACCEL          0 : 2171
      ROTARYTRANSOFFSET    0 : 2171
      SPACES               0 : 2170  2170  2180  2180  2186  2186  2198  2198  2221  2221  2264  2264
      VERTICALACCEL        0 : 2171
      VERTICALTRANSOFFSET  0 : 2171
      WAITFORRETURN        0 : 2169  2211  2215  2225  2229  2249
      ZPCASE               0 : 2160  2161  2163  2164  2167  2174
LOCAL: ZPKEYS              2149 : 2149  2161  2167  2167

```

```

FUNCT: ZYMATEWAIT          FILE=ORCA3.CC
GLOBL: ABORT               0 : 423
      AXISERROR            0 : 335  336  368  417  425
      BASESTATUS           0 : 369  370  373  376  379  385  391  403  410  414
      DUMMYPTR             0 : 412
      MAXRXWAIT            0 : 361  363
      MOVING               0 : 366
      ROBOTMESSAGE         0 : 361  363  369  414
      TEXT                 0 : 369  414
PARAM: WAITTYPE            331 : 330  331  338  338  342  364
LOCAL: HOLDMMSG            334 : 334  405
      THERMALMSG           333 : 333  399

```

**C-DOC
COMPLEXITY ANALYSIS**

Function vs Complexity/Quality
 ** *****

		Path	'C'	CODE	CMMNT	Total
		COMPLXTY	Stmts	Lines	Lines	Lines
(null)	ORCA1.CC	0	205	243	307	529
BASECOORDINATESCREEN	ORCA1.CC	7	26	36	2	38
BASEFKEYS	ORCA2.CC	19	51	95	1	101
BASEFUNCTIONSCREEN	ORCA1.CC	1	14	16	1	19
BASESENSESCREEN	ORCA1.CC	7	31	41	2	43
BASPEEDSCREEN	ORCA1.CC	8	30	40	2	42
CALCULATEBASEAXISCOUNTS	ORCA3.CC	1	5	7	0	9
CALCULATEHANDAXISCOUNTS	ORCA3.CC	2	8	14	0	17
CALIBRATIONSCREEN	ORCA1.CC	9	57	81	9	94
CHANGELocationSCREEN	ORCA1.CC	8	33	49	0	53
CLEARFUNCTIONAREA	ORCA1.CC	3	5	11	0	13
CLEARKEYBOXES	ORCA1.CC	2	4	8	13	21
CLEARNAMEAREA	ORCA1.CC	1	3	5	1	7
COMMUNICATEWITHROBOT	ORCA3.CC	4	11	19	1	22
COMPUTEABSOLUTE	ORCA2.CC	1	4	6	0	8
COMPUTECHECKSUM	ORCA3.CC	2	8	12	0	14
COMPUTEHAND	ORCA2.CC	1	4	6	1	8
COMPUTERACKLOCATION	ORCA2.CC	4	18	31	3	36
COMPUTERELATIVE	ORCA2.CC	1	4	6	0	8
DELETECOMMANDSCREEN	ORCA1.CC	5	19	35	1	41
DISPLAYBASEFORCES	ORCA2.CC	4	20	34	0	39
DISPLAYBASEFUNCTIONKEYS	ORCA1.CC	1	11	13	0	15
DISPLAYCOLLISIONMESSAGE	ORCA2.CC	9	25	55	0	60
DISPLAYCURRENTGRIPFORCE	ORCA2.CC	2	8	14	0	17
DISPLAYCURRENTHAND	ORCA2.CC	2	4	8	0	10
DISPLAYHANDFUNCTIONKEYS	ORCA1.CC	1	10	12	0	14
DISPLAYMAINSCREEN	ORCA1.CC	2	20	24	0	26
DISPLAYNUMBER	ORCA3.CC	1	13	15	0	17
DIVRND	ORCA3.CC	2	7	13	1	15
DOBSEZEROS	ORCA1.CC	12	30	54	2	57
DORAL	ORCA1.CC	8	35	61	1	68
DIRECTIONCONTROL	ORCA3.CC	2	24	30	1	33
DISTZEROS	ORCA1.CC	12	30	54	1	57
UPPER	ORCA2.CC	2	6	12	0	15
GLASEFORCEVALUES	ORCA3.CC	1	8	10	2	14
GETCALIBRATIONDATA	ORCA2.CC	2	14	20	1	23
GETDICTIONARYHANDOFFSETS	ORCA2.CC	1	4	6	0	8
GETPOSITION	ORCA2.CC	13	50	99	9	112
GETSCALEDATA	ORCA1.CC	1	3	5	0	7
GETSCALEDNR1	ORCA1.CC	3	11	19	0	22
GETWRISTFORCEVALUES	ORCA3.CC	1	7	9	1	11
HANDCOORDINATESCREEN	ORCA1.CC	7	26	36	2	38
HANDDEFINITIONSCREEN	ORCA1.CC	12	80	119	6	131
HANDFKEYS	ORCA2.CC	17	46	82	1	86
HANDFUNCTIONSCREEN	ORCA1.CC	1	11	13	1	16
HANDSENSESCREEN	ORCA1.CC	7	29	39	2	41
HANDSPEEDSCREEN	ORCA1.CC	8	30	40	2	42
INITZYMATE	ORCA1.CC	92	412	583	13	628
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INPUTANDMOVETORACKINDEX	ORCA1.CC	3	16	24	0	27
LOADDATABASE	ORCA3.CC	4	30	44	0	49
LOADDATABASEWAIT	ORCA1.CC	1	12	14	0	15
LOADDATAWRIST	ORCA3.CC	4	24	38	0	43
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MONUMENTSCREEN	ORCA1.CC	20	98	158	4	174
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RANGECHECKEDSPEEDIN	ORCA1.CC	3	9	17	0	20
RANGECHECKPOSITION	ORCA1.CC	3	6	14	0	17
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MESSAGEAREAANDUART	ORCA3.CC	1	30	32	19	41
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RETURNCHECKSUMOK	ORCA3.CC	3	11	19	0	22
RETURNTOEXEC	ORCA1.CC	2	4	8	1	10
SAVECALIBRATIONDATA	ORCA2.CC	1	7	9	0	11

C-DOC

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SF TOLUTE	ORCA2.CC	1	7	9	0	11
S TORYCAL	ORCA2.CC	5	20	30	0	32
ND	ORCA2.CC	1	4	6	0	8
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TOTAL SYSTEM SUMMARY		680	3190	4711	548	5516

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ROMPS CRITICAL DESIGN REVIEW

Volume II—Robot Module Design Documentation

M.E. DOBBS
DECEMBER 1992

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Space Automation
& Robotics Center

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**ROBOT MODULE
DESIGN
DOCUMENTATION**

**ROBOT MODULE
ROMPS MODIFICATIONS**

ROBOT MODULE MODIFICATIONS

November 16, 1992

The following modifications will be made to the Zymark Robot Module to meet the Remote Operated Material Processing System requirements:

- Modify the 'C' Robot Module Source Code supplied by Zymark in order to re-compile and test a baseline version of the Robot Module.
- Modify the axis terminology used by Zymark to be consistent with the axis terminology used by Goddard (Vertical = Elevation, Reach = Radial, Rotary = Azimuth).
- Modify the axis calibration factors to accommodate the ROMPS Robot.
- Modify error handling so that an error is always sent back to the interpreter if, for any reason, a command does not complete successfully.
- Add ROMPS Robot/XP commands.
- Add ROMPS Easylab/Robot Command Variables.

EASYLAB COMMANDS DEFINITIONS

ROBOT MODULE EASYPAB COMMAND VARIABLES

Space Automated Research Center (SpARC)

December 3, 1992

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NAME: **S:ELEVATION**

SYNTAX: **S:ELEVATION = x or ? S:ELEVATION**

x = absolute elevation axis position in inches

0 <= x <= 18

DESCRIPTION: ELEVATION POSITION COMMAND VARIABLE
COMMANDCODE #9

Move elevation axis to an absolute position or get the current elevation axis position from the XP servo controller.

EXAMPLE: **S:ELEVATION = 3**

? S:ELEVATION
3

NAME: **S:RADIAL**

SYNTAX: **S:RADIAL = x or ? S:RADIAL**

x = absolute radial axis position in inches

3 <= x <= 7

DESCRIPTION: RADIAL POSITION COMMAND VARIABLE
COMMANDCODE #10

Move radial axis to an absolute position or get the current radial axis position from the XP servo controller.

EXAMPLE: **S:RADIAL = 4.5**

? S:RADIAL
4.5

NAME: **S:AZIMUTH**

SYNTAX: **S:AZIMUTH = x or ? S:AZIMUTH**

x = absolute azimuth axis position in degrees

$0 \leq x \leq 360$

DESCRIPTION: **AZIMUTH POSITION COMMAND VARIABLE**
 COMMANDCODE #11

Move azimuth axis to an absolute position or get the current azimuth axis position from the XP servo controller.

EXAMPLE: **S:AZIMUTH = 180**

? S:AZIMUTH
180

NAME: **S:SPEED**

SYNTAX: **S:SPEED = x or ? S:SPEED**

x = 3 axis speed. Speed is not a direct measure of units/time, but is a relative measure (i.e. 2 is faster than 1).

DESCRIPTION: **3 AXIS SPEED COMMAND VARIABLE**
 COMMANDCODE #15

Set new speed for elevation, radial, and azimuth axes or return the last 3 axis speed setting. Note that the speed value returned reflects the actual axis speeds only if the last speed setting was a 3 axis speed. To guarantee the speed value returned is the actual axis speed, use the individual axis speed commands: S:ELEVATION.SPEED, S:RADIAL.SPEED, and S:AZIMUTH.SPEED.

EXAMPLE: **S:SPEED = 2**

? S:SPEED
2

NAME: **S:ELEVATION.SPEED**

SYNTAX: **S:ELEVATION.SPEED = x or ? S:ELEVATION.SPEED**

x = elevation axis speed. Speed is not a direct measure of units/time, but is a relative measure (i.e. 2 is faster than 1).

DESCRIPTION: ELEVATION SPEED COMMAND VARIABLE
 COMMANDCODE #16

Set new speed for elevation axis or get the current speed setting from the XP servo controller.

EXAMPLE: **S:ELEVATION.SPEED = 1**

? S:ELEVATION.SPEED
1

NAME: **S:RADIAL.SPEED**

SYNTAX: **S:RADIAL.SPEED = x or ? S:RADIAL.SPEED**

x = radial axis speed. Speed is not a direct measure of units/time, but is a relative measure (i.e. 2 is faster than 1).

DESCRIPTION: RADIAL SPEED COMMAND VARIABLE
 COMMANDCODE #17

Set new speed for radial axis or get the current speed setting from the XP servo controller.

EXAMPLE: **S:RADIAL.SPEED = 3**

? S:RADIAL.SPEED
3

NAME: **S:AZIMUTH.SPEED**

SYNTAX: **S:AZIMUTH.SPEED = x or ? S:AZIMUTH.SPEED**

x = azimuth axis speed. Speed is not a direct measure of units/time, but is a relative measure (i.e. 2 is faster than 1).

DESCRIPTION: **AZIMUTH SPEED COMMAND VARIABLE**
COMMANDCODE #18

Set new speed for azimuth axis or get the current speed setting from the XP servo controller.

EXAMPLE: **S:AZIMUTH.SPEED = 1**

? S:AZIMUTH.SPEED

NAME: **S:GRIP.SPEED**

SYNTAX: **S:GRIP.SPEED = x or ? S:GRIP.SPEED**

x = gripper axis speed. Speed is not a direct measure of units/time, but is a relative measure (i.e. 2 is faster than 1).

DESCRIPTION: **GRIP SPEED COMMAND VARIABLE**
COMMANDCODE #20

Set new speed for gripper or get the current speed setting from the XP servo controller.

EXAMPLE: **S:GRIP.SPEED = 2**

? S:GRIP.SPEED
2

NAME: **S:SET.ABS**

SYNTAX: **S:SET.ABS <variable>**

<variable> = absolute command variable or rack location.

DESCRIPTION: SET ABSOLUTE COMMAND VARIABLE
 COMMANDCODE #28

Set last absolute position to the absolute or rack position defined by **<variable>**. No robot moves are executed. This command is used to define an absolute position before executing relative moves.

EXAMPLE: **S:SET.ABS R1:RACK**
 S:C.REL\$

NAME: **S:TRANS.ON**

SYNTAX: **S:TRANS.ON**

DESCRIPTION: TRANSITION POSITION ON COMMAND
 COMMANDCODE #31

Allow transitional moves. Once the current move is in the vicinity of it's target position, the next move can be executed.

EXAMPLE: **S:TRANS.ON**

NAME: **S:ELEVATION.CMD**

SYNTAX: S:ELEVATION.CMD = *x* or ? S:ELEVATION.CMD

x = absolute elevation axis position in inches

$0 \leq x \leq 18$

DESCRIPTION: COMMAND VARIABLE ELEVATION POSITION
COMMANDCODE #50

Define/modify or return the elevation position of a command variable. When defining/modifying an elevation position, the command variable isn't updated until an S:SET.BASE.CMD is executed. The elevation position returned from a query is from the last S:GET.BASE.CMD command.

EXAMPLE: S:GET.BASE.CMD <variable>
S:ELEVATION.CMD = 3
S:SET.BASE.CMD <variable>

NAME: **S:RADIAL.CMD**

SYNTAX: S:RADIAL.CMD = *x* or ? S:RADIAL.CMD

x = absolute radial axis position in inches

$3 \leq x \leq 7$

DESCRIPTION: COMMAND VARIABLE RADIAL POSITION
COMMANDCODE #51

Define/modify or return the radial position of a command variable. When defining/modifying a radial position, the command variable isn't updated until an S:SET.BASE.CMD is executed. The radial position returned from a query is from the last S:GET.BASE.CMD command.

EXAMPLE: S:GET.BASE.CMD <variable>
? S:RADIAL.CMD
4.5
S:RADIAL.CMD = 3.5
S:SET.BASE.CMD <variable>

NAME: **S:AZIMUTH.CMD**

SYNTAX: S:AZIMUTH.CMD = *x* or ? S:AZIMUTH.CMD

x = absolute azimuth axis position in degrees

$0 \leq x \leq 360$

DESCRIPTION: COMMAND VARIABLE AZIMUTH POSITION
 COMMANDCODE #52

Define/modify or return the azimuth position of a command variable. When defining/modifying an azimuth position, the command variable isn't updated until an S:SET.BASE.CMD is executed. The azimuth position returned from a query is from the last S:GET.BASE.CMD command.

EXAMPLE: S:ELEVATION.CMD = 3
 S:RADIAL.CMD = 3.5
 S:AZIMUTH.CMD = 180
 S:SET.BASE.CMD <variable>
 ? S:AZIMUTH.CMD
 180

NAME: **S:GRIP.CMD**

SYNTAX: S:GRIP.CMD = *x* or ? S:GRIP.CMD

x = absolute gripper axis position in inches

$0 \leq x \leq .7$

DESCRIPTION: COMMAND VARIABLE GRIP POSITION
 COMMANDCODE #53

Define/modify or return the grip position of a command variable. When defining/modifying a grip position, the command variable isn't updated until an S:SET.HAND.CMD is executed. The grip position returned from a query is from the last S:GET.HAND.CMD command.

EXAMPLE: S:GET.HAND.CMD
 S:GRIP.CMD = .5
 S:SET.HAND.CMD

NAME: **S:SET.BASE.CMD**

SYNTAX: S:SET.BASE.CMD <variable>

 <variable> = absolute command variable.

DESCRIPTION: SET BASE COMMAND VARIABLE
 COMMANDCODE #54

Define/modify the elevation, radial, and azimuth positions of a command variable.

EXAMPLE: S:GET.BASE.CMD <variable>
 ? S:ELEVATION
 1
 ? S:RADIAL
 3.5
 ? S:AZIMUTH
 175
 S:ELEVATION = 2
 S:RADIAL = 3.75
 S:AZIMUTH = 90
 S:SET.BASE.CMD <variable>

NAME: **S:GET.BASE.CMD**

SYNTAX: S:GET.BASE.CMD <variable>

 <variable> = absolute command variable.

DESCRIPTION: GET BASE COMMAND VARIABLE
 COMMANDCODE #55

Get the elevation, radial, and azimuth positions of a command variable.

EXAMPLE: S:GET.BASE.CMD <variable>
 ? S:ELEVATION
 1
 ? S:RADIAL
 3.75
 ? S:AZIMUTH
 175

NAME: **S:SET.HAND.CMD**

SYNTAX: S:SET.HAND.CMD <variable>

 <variable> = hand definition variable.

DESCRIPTION: SET HAND COMMAND VARIABLE
 COMMANDCODE #56

Set the grip position of a hand definition variable.

EXAMPLE: S:GET.HAND.CMD <variable>
 ? S:GRIP
 .4
 S:GRIP = 0
 S:SET.HAND.CMD <variable>

NAME: **S:GET.HAND.CMD**

SYNTAX: S:GET.HAND.CMD <variable>

 <variable> = hand definition variable.

DESCRIPTION: GET HAND COMMAND VARIABLE
 COMMANDCODE #57

Get the grip position of a hand definition variable.

EXAMPLE: S:GET.HAND.CMD <variable>
 ? S:GRIP
 0

NAME: **S:ZERO.ELEVATION**

SYNTAX: S:ZERO.ELEVATION

DESCRIPTION: ZERO ELEVATION AXIS
 COMMANDCODE #58

Set the current elevation axis position to { 0 }. This command can be used to recover from a situation where the axis position is unknown.

EXAMPLE: S:ZERO.ELEVATION

NAME: **S:ZERO.RADIAL**

SYNTAX: S:ZERO.RADIAL

DESCRIPTION: ZERO RADIAL AXIS
 COMMANDCODE #59

Set the current radial axis position to { 0 }. This command can be used to recover from a situation where the axis position is unknown.

EXAMPLE: S:ZERO.RADIAL

NAME: **S:ZERO.AZIMUTH**

SYNTAX: **S:ZERO.AZIMUTH**

DESCRIPTION: ZERO AZIMUTH AXIS
COMMANDCODE #60

Set the current azimuth axis position to { 0 }. This command can be used to recover from a situation where the axis position is unknown.

EXAMPLE: **S:ZERO.AZIMUTH**

NAME: **S:ZERO.GRIP**

SYNTAX: **S:ZERO.GRIP**

DESCRIPTION: ZERO GRIP AXIS
COMMANDCODE #61

Set the current grip axis position to { 0 }. This command can be used to recover from a situation where the axis position is unknown.

EXAMPLE: **S:ZERO.GRIP**

NAME: **S:CALIBRATE.ELEVATION**

SYNTAX: **S:CALIBRATE.ELEVATION**

DESCRIPTION: CALIBRATE ELEVATION AXIS
COMMANDCODE #62

Determine where absolute zero is by moving the axis into the limit, backing away from the limit, and setting the axis position to {0}.

EXAMPLE: **S:CALIBRATE.ELEVATION**

NAME: **S:CALIBRATE.RADIAL**

SYNTAX: **S:CALIBRATE.RADIAL**

DESCRIPTION: CALIBRATE RADIAL AXIS
COMMANDCODE #63

Determine where absolute zero is by moving the axis into the limit, backing away from the limit, and setting the axis position to {0}.

EXAMPLE: **S:CALIBRATE.RADIAL**

NAME: S:CALIBRATE.AZIMUTH

SYNTAX: S:CALIBRATE.AZIMUTH

DESCRIPTION: CALIBRATE AZIMUTH AXIS
COMMANDCODE #64

Determine where absolute zero is by moving the axis into the limit, backing away from the limit, and setting the axis position to {0}.

EXAMPLE: S:CALIBRATE.AZIMUTH

NAME: S:CALIBRATE.GRIP

SYNTAX: S:CALIBRATE.GRIP

DESCRIPTION: CALIBRATE GRIP AXIS
COMMANDCODE #65

Determine where absolute zero is by moving the axis into the limit, backing away from the limit, and setting the axis position to {0}.

EXAMPLE: S:CALIBRATE.GRIP

NAME: **S:ELEVATION.PGAIN**

SYNTAX: **S:ELEVATION.PGAIN = x** or **? S:ELEVATION.PGAIN**

x = proportional gain term (KP) for servo calculations.

0 <= x <= 255.999 (accuracy of .004)

DESCRIPTION: ELEVATION PROPORTIONAL GAIN COMMAND
COMMANDCODE #66

Define the proportional gain term (KP) used in the servo calculations for the elevation axis or get the current proportional gain term from the XP servo controller.

EXAMPLE: **S:ELEVATION.PGAIN = 0**
? S:ELEVATION.PGAIN
0

NAME: **S:RADIAL.PGAIN**

SYNTAX: **S:RADIAL.PGAIN = x** or **? S:RADIAL.PGAIN**

x = proportional gain term (KP) for servo calculations.

0 <= x <= 255.999 (accuracy of .004)

DESCRIPTION: RADIAL PROPORTIONAL GAIN COMMAND
COMMANDCODE #67

Define the proportional gain term (KP) used in the servo calculations for the radial axis or get the current proportional gain term from the XP servo controller.

EXAMPLE: **S:RADIAL.PGAIN = 0**
? S:RADIAL.PGAIN
0

NAME: S:AZIMUTH.PGAIN

SYNTAX: S:AZIMUTH.PGAIN = x or ? S:AZIMUTH.PGAIN

x = proportional gain term (KP) for servo calculations.

$0 \leq x \leq 255.999$ (accuracy of .004)

DESCRIPTION: AZIMUTH PROPORTIONAL GAIN COMMAND
COMMANDCODE #68

Define the proportional gain term (KP) used in the servo calculations for the azimuth axis or get the current proportional gain term from the XP servo controller.

EXAMPLE: S:AZIMUTH.PGAIN = 0
? S:AZIMUTH.PGAIN
0

NAME: S:GRIP.PGAIN

SYNTAX: S:GRIP.PGAIN = x or ? S:GRIP.PGAIN

x = proportional gain term (KP) for servo calculations.

$0 \leq x \leq 255.999$ (accuracy of .004)

DESCRIPTION: GRIP PROPORTIONAL GAIN COMMAND
COMMANDCODE #69

Define the proportional gain term (KP) used in the servo calculations for the grip axis or get the current proportional gain term from the XP servo controller.

EXAMPLE: S:GRIP.PGAIN = 0
? S:GRIP.PGAIN
0

NAME: **S:ELEVATION.IGAIN**

SYNTAX: **S:ELEVATION.IGAIN = x** or **? S:ELEVATION.IGAIN**

x = integral gain term (KI) for servo calculations.

0 <= x <= 255.999 (accuracy of .004)

DESCRIPTION: ELEVATION INTEGRAL GAIN COMMAND
COMMANDCODE #70

Define the integral gain term (KI) used in the servo calculations for the elevation axis or get the current integral gain term from the XP servo controller.

EXAMPLE: **S:ELEVATION.IGAIN = 0**
? S:ELEVATION.IGAIN
0

NAME: **S:RADIAL.IGAIN**

SYNTAX: **S:RADIAL.IGAIN = x** or **? S:RADIAL.IGAIN**

x = integral gain term (KI) for servo calculations.

0 <= x <= 255.999 (accuracy of .004)

DESCRIPTION: RADIAL INTEGRAL GAIN COMMAND
COMMANDCODE #71

Define the integral gain term (KI) used in the servo calculations for the radial axis or get the current integral gain term from the XP servo controller.

EXAMPLE: **S:RADIAL.IGAIN = 0**
? S:RADIAL.IGAIN
0

NAME: **S:AZIMUTH.IGAIN**

SYNTAX: S:AZIMUTH.IGAIN = x or ? S:AZIMUTH.IGAIN

x = integral gain term (KI) for servo calculations.

0 <= x <= 255.999 (accuracy of .004)

DESCRIPTION: AZIMUTH INTEGRAL GAIN COMMAND
COMMANDCODE #72

Define the integral gain term (KI) used in the servo calculations for the azimuth axis or get the current integral gain term from the XP servo controller.

EXAMPLE: S:AZIMUTH.IGAIN = 0
 ? S:AZIMUTH.IGAIN
 0

NAME: **S:GRIP.IGAIN**

SYNTAX: S:GRIP.IGAIN = x or ? S:GRIP.IGAIN

x = integral gain term (KI) for servo calculations.

0 <= x <= 255.999 (accuracy of .004)

DESCRIPTION: GRIP INTEGRAL GAIN COMMAND
COMMANDCODE #73

Define the integral gain term (KI) used in the servo calculations for the grip axis or get the current integral gain term from the XP servo controller.

EXAMPLE: S:GRIP.IGAIN = 0
 ? S:GRIP.IGAIN
 0

NAME: **S:ELEVATION.DGAIN**

SYNTAX: S:ELEVATION.DGAIN = x or ? S:ELEVATION.DGAIN

x = derivative gain term (KD) for servo calculations.

0 <= x <= 255.999 (accuracy of .004)

DESCRIPTION: ELEVATION DERIVATIVE GAIN COMMAND
COMMANDCODE #74

Define the derivative gain term (KD) used in the servo calculations for the elevation axis or get the current derivative gain term from the XP servo controller.

EXAMPLE: S:ELEVATION.DGAIN = 0
? S:ELEVATION.DGAIN
0

NAME: **S:RADIAL.DGAIN**

SYNTAX: S:RADIAL.DGAIN = x or ? S:RADIAL.DGAIN

x = derivative gain term (KD) for servo calculations.

0 <= x <= 255.999 (accuracy of .004)

DESCRIPTION: RADIAL DERIVATIVE GAIN COMMAND
COMMANDCODE #75

Define the derivative gain term (KD) used in the servo calculations for the radial axis or get the current derivative gain term from the XP servo controller.

EXAMPLE: S:RADIAL.DGAIN = 0
? S:RADIAL.DGAIN
0

NAME: **S:AZIMUTH.DGAIN**

SYNTAX: **S:AZIMUTH.DGAIN = x or ? S:AZIMUTH.DGAIN**

x = derivative gain term (KD) for servo calculations.

0 <= x <= 255.999 (accuracy of .004)

DESCRIPTION: AZIMUTH DERIVATIVE GAIN COMMAND
COMMANDCODE #76

Define the derivative gain term (KD) used in the servo calculations for the azimuth axis or get the current derivative gain term from the XP servo controller.

EXAMPLE: **S:AZIMUTH.DGAIN = 0**
 ? S:AZIMUTH.DGAIN
 0

NAME: **S:GRIP.DGAIN**

SYNTAX: **S:GRIP.DGAIN = x or ? S:GRIP.DGAIN**

x = derivative gain term (KD) for servo calculations.

0 <= x <= 255.999 (accuracy of .004)

DESCRIPTION: GRIP DERIVATIVE GAIN COMMAND
COMMANDCODE #77

Define the derivative gain term (KD) used in the servo calculations for the grip axis or get the current derivative gain term from the XP servo controller.

EXAMPLE: **S:GRIP.DGAIN = 0**
 ? S:GRIP.DGAIN
 0

NAME: **S:ELEVATION.ILIMIT**

SYNTAX: **S:ELEVATION.ILIMIT = x or ? S:ELEVATION.ILIMIT**

x = inetgrator limit for servo calculations.

0 <= x <= 255.999 (accuracy of .004)

DESCRIPTION: **ELEVATION INTEGRATOR LIMIT COMMAND**
COMMANDCODE #78

Define the integrator limit used in the servo calculations for the elevation axis or get the current integrator limit from the XP servo controller.

EXAMPLE: **S:ELEVATION.ILIMIT = 0**
 ? S:ELEVATION.ILIMIT
 0

NAME: **S:RADIAL.ILIMIT**

SYNTAX: **S:RADIAL.ILIMIT = x or ? S:RADIAL.ILIMIT**

x = integrator limit for servo calculations.

0 <= x <= 255.999 (accuracy of .004)

DESCRIPTION: **RADIAL INTEGRATOR LIMIT COMMAND**
COMMANDCODE #79

Define the integrator limit used in the servo calculations for the radial axis or get the current integrator limit from the XP servo controller.

EXAMPLE: **S:RADIAL.ILIMIT = 0**
 ? S:RADIAL.ILIMIT
 0

NAME: **S:AZIMUTH.ILIMIT**

SYNTAX: **S:AZIMUTH.ILIMIT = x or ? S:AZIMUTH.ILIMIT**

x = integrator limit for servo calculations.

0 <= x <= 255.999 (accuracy of .004)

DESCRIPTION: AZIMUTH INTEGRATOR LIMIT COMMAND
COMMANDCODE #80

Define the integrator limit used in the servo calculations for the azimuth axis or get the current integrator limit from the XP servo controller.

EXAMPLE: **S:AZIMUTH.ILIMIT = 0**
 ? S:AZIMUTH.ILIMIT
 0

NAME: **S:GRIP.ILIMIT**

SYNTAX: **S:GRIP.ILIMIT = x or ? S:GRIP.ILIMIT**

x = integrator limit for servo calculations.

0 <= x <= 255.999 (accuracy of .004)

DESCRIPTION: GRIP INTEGRATOR LIMIT COMMAND
COMMANDCODE #81

Define the integrator limit used in the servo calculations for the grip axis or get the current integrator limit from the XP servo controller.

EXAMPLE: **S:GRIP.ILIMIT = 0**
 ? S:GRIP.ILIMIT
 0

NAME: **S:ELEVATION.IWINDOW**

SYNTAX: **S:ELEVATION.IWINDOW = x** or **? S:ELEVATION.IWINDOW**

x = integrator window for servo calculations.

0 <= x <= 255.999 (accuracy of .004)

DESCRIPTION: ELEVATION INTEGRATOR WINDOW COMMAND
COMMANDCODE #82

Define the integrator window used in the servo calculations for the elevation axis or get the current integrator window from the XP servo controller.

EXAMPLE: **S:ELEVATION.IWINDOW = 0**
? S:ELEVATION.IWINDOW
0

NAME: **S:RADIAL.IWINDOW**

SYNTAX: **S:RADIAL.IWINDOW = x** or **? S:RADIAL.IWINDOW**

x = integrator window for servo calculations.

0 <= x <= 255.999 (accuracy of .004)

DESCRIPTION: RADIAL INTEGRATOR WINDOW COMMAND
COMMANDCODE #83

Define the integrator window used in the servo calculations for the radial axis or get the current integrator window from the XP servo controller.

EXAMPLE: **S:RADIAL.IWINDOW = 0**
? S:RADIAL.IWINDOW
0

NAME: **S:AZIMUTH.IWINDOW**

SYNTAX: **S:AZIMUTH.IWINDOW = x** or **? S:AZIMUTH.IWINDOW**

x = integrator window for servo calculations.

$0 \leq x \leq 255.999$ (accuracy of .004)

DESCRIPTION: AZIMUTH INTEGRATOR WINDOW COMMAND
 COMMANDCODE #84

Define the integrator window used in the servo calculations for the azimuth axis or get the current integrator window from the XP servo controller.

EXAMPLE: **S:AZIMUTH.IWINDOW = 0**
 ? S:AZIMUTH.IWINDOW
 0

NAME: **S:GRIP.IWINDOW**

SYNTAX: **S:GRIP.IWINDOW = x** or **? S:GRIP.IWINDOW**

x = integrator window for servo calculations.

$0 \leq x \leq 255.999$ (accuracy of .004)

DESCRIPTION: GRIP INTEGRATOR WINDOW COMMAND
 COMMANDCODE #85

Define the integrator window used in the servo calculations for the grip axis or get the current integrator window from the XP servo controller.

EXAMPLE: **S:GRIP.IWINDOW = 0**
 ? S:GRIP.IWINDOW

NAME: S:ELEVATION.EOT.OVERRIDE

SYNTAX: S:ELEVATION.EOT.OVERRIDE = 0/1
or
? S:ELEVATION.EOT.OVERRIDE

0 = don't override
1 = override

DESCRIPTION: ELEVATION END OF TRAVEL OVERRIDE COMMAND
COMMANDCODE #86

Override/don't override end of travel fault condition or get the current end of travel override setting from the XP controller. If an end of travel fault is overridden, it is important to clear the override after the fault condition is removed. If the override is not cleared, end of travel on that axis cannot be detected.

EXAMPLE: ? S:ELEVATION.EOT.OVERRIDE
1
S:ELEVATION.EOT.OVERRIDE = 0

NAME: S:RADIAL.EOT.OVERRIDE

SYNTAX: S:RADIAL.EOT.OVERRIDE = 0/1
or
? S:RADIAL.EOT.OVERRIDE

0 = don't override
1 = override

DESCRIPTION: RADIAL END OF TRAVEL OVERRIDE COMMAND
COMMANDCODE #87

Override/don't override end of travel fault condition or get the current end of travel override setting from the XP controller. If an end of travel fault is overridden, it is important to clear the override after the fault condition is removed. If the override is not cleared, end of travel on that axis cannot be detected.

EXAMPLE: ? S:RADIAL.EOT.OVERRIDE
1
S:RADIAL.EOT.OVERRIDE = 0

NAME: **S:ELEVATION.OVF.OVERRIDE**

SYNTAX: S:ELEVATION.OVF.OVERRIDE = 0/1
or
? S:ELEVATION.OVF.OVERRIDE

0 = don't override
1 = override

DESCRIPTION: ELEVATION OVERFORCE OVERRIDE COMMAND
COMMANDCODE #90

Override/don't override overforce fault condition or get the current overforce override setting from the XP controller. If an overforce fault condition is overridden, it is important to clear the override after the fault condition is removed. If the override is not cleared, overforce on that axis cannot be detected.

EXAMPLE: ? S:ELEVATION.OVF.OVERRIDE
1
S:ELEVATION.OVF.OVERRIDE = 0

NAME: **S:RADIAL.OVF.OVERRIDE**

SYNTAX: S:RADIAL.OVF.OVERRIDE = 0/1
or
? S:RADIAL.OVF.OVERRIDE

0 = don't override
1 = override

DESCRIPTION: RADIAL OVERFORCE OVERRIDE COMMAND
COMMANDCODE #91

Override/don't override overforce fault condition or get the current overforce override setting from the XP controller. If an overforce fault condition is overridden, it is important to clear the override after the fault condition is removed. If the override is not cleared, overforce on that axis cannot be detected.

EXAMPLE: ? S:RADIAL.OVF.OVERRIDE
1
S:RADIAL.OVF.OVERRIDE = 0

NAME: **S:AZIMUTH.OVF.OVERRIDE**

SYNTAX: S:AZIMUTH.OVF.OVERRIDE = 0/1
or
? S:AZIMUTH.OVF.OVERRIDE

0 = don't override
1 = override

DESCRIPTION: AZIMUTH OVERFORCE OVERRIDE COMMAND
COMMANDCODE #92

Override/don't override overforce fault condition or get the current overforce override setting from the XP controller. If an overforce fault condition is overridden, it is important to clear the override after the fault condition is removed. If the override is not cleared, overforce on that axis cannot be detected.

EXAMPLE: ? S:AZIMUTH.OVF.OVERRIDE
1
S:AZIMUTH.OVF.OVERRIDE = 0

NAME: **S:GRIP.OVF.OVERRIDE**

SYNTAX: S:GRIP.OVF.OVERRIDE = 0/1
or
? S:GRIP.OVF.OVERRIDE

0 = don't override
1 = override

DESCRIPTION: GRIP OVERFORCE OVERRIDE COMMAND
COMMANDCODE #93

Override/don't override overforce fault condition or get the current overforce override setting from the XP controller. If an overforce fault condition is overridden, it is important to clear the override after the fault condition is removed. If the override is not cleared, overforce on that axis cannot be detected.

EXAMPLE: ? S:GRIP.OVF.OVERRIDE
1
S:GRIP.OVF.OVERRIDE = 0

NAME: **S:OVF.STATUS**

SYNTAX: ? S:OVF.STATUS

DESCRIPTION: OVERFORCE STATUS COMMAND
 COMMANDCODE #94

Get the limit status from the XP controller and return a bitmapped status byte containing the overforce status for all applicable axes:

Bit 0	Left gripper is in 'open' overforce state
Bit 1	Left gripper is in 'closed' overforce state
Bit 2	Right gripper is in 'open' overforce state
Bit 3	Right gripper is in 'closed' overforce state
Bit 4	Radial axis is in 'in' overforce state
Bit 5	Radial axis is in 'out' overforce state
Bit 6	Elevation axis is in 'up' overforce state
Bit 7	Elevation axis is in 'down' overforce state

EXAMPLE: ? S:OVF.STATUS
0

NAME: **S:EOT.STATUS**

SYNTAX: ? S:EOT.STATUS

DESCRIPTION: END OF TRAVEL STATUS COMMAND
 COMMANDCODE #95

Get the limit status from the XP controller and return a bitmapped status byte containing the end of travel status for all axes:

Bit 0	Gripper is in 'open' end of travel
Bit 1	Gripper is 'closed' end of travel
Bit 2	Azimuth axis is in 'left' end of travel
Bit 3	Azimuth axis is in 'right' end of travel
Bit 4	Radial axis is in 'in' end of travel
Bit 5	Radial axis is in 'out' end of travel
Bit 6	Elevation axis is in 'up' end of travel
Bit 7	Elevation axis is in 'down' end of travel

EXAMPLE: ? S:EOT.STATUS
0

NAME: **S:VER.STATUS**

SYNTAX: ? S:VER.STATUS

DESCRIPTION: VELOCITY ERROR STATUS COMMAND
COMMANDCODE #96

Get the limit status from the XP controller and return a bitmapped status byte containing the velocity error status for all axes:

Bit 0	Gripper axis stalled
Bit 1	Azimuth axis stalled
Bit 2	Radial axis stalled
Bit 3	Elevation axis stalled
Bit 4	Not used
Bit 5	Not used
Bit 6	Not used
Bit 7	Not used

EXAMPLE: ? S:VER.STATUS
0

NAME: **S:BASE.MOVE.STATUS**

SYNTAX: ? S:BASE.MOVE.STATUS

DESCRIPTION: BASE MOVE STATUS COMMAND
COMMANDCODE #97

Get the move status from the XP controller and return a bitmapped status byte containing the move status for the base:

Bit 0	Azimuth axis failed to reach position
Bit 1	Vertical axis failed to reach position
Bit 2	Reach axis failed to reach position
Bit 3	Not used
Bit 4	Not used
Bit 5	Not used
Bit 6	Not used
Bit 7	Not used

EXAMPLE: ? S:BASE.MOVE.STATUS
0

NAME: **S:GRIP.MOVE.STATUS**

SYNTAX: ? S:GRIP.MOVE.STATUS

DESCRIPTION: GRIP MOVE STATUS COMMAND
COMMANDCODE #98

Get the hand status from the XP controller and return a bitmapped status byte containing the move status for the gripper:

Bit 0	Not used
Bit 1	Not used
Bit 2	Gripper failed to reach position
Bit 3	Not used
Bit 4	Not used
Bit 5	Not used
Bit 6	Not used
Bit 7	Not used

EXAMPLE: ? S:GRIP.MOVE.STATUS
0

NAME: **S:COMM.STATUS**

SYNTAX: ? S:COMM.STATUS

DESCRIPTION: COMMUNICATION STATUS COMMAND
COMMANDCODE #99

Return a bitmapped status byte containing the communication status of the last XP servo command:

Bit 0	Not used
Bit 1	Not used
Bit 2	Not used
Bit 3	Not used
Bit 4	Invalid checksum
Bit 5	Invalid command code
Bit 6	Invalid byte count
Bit 7	Interbyte timeout

EXAMPLE: ? S:COMM.STATUS
0

NAME: **S:MODULE.STATUS**

SYNTAX: ? S:MODULE.STATUS

DESCRIPTION: ROBOT MODULE STATUS COMMAND
 COMMANDCODE #100

Return the status of the last EasyLab command:

- 1 = Hard abort
- 2 = User stop
- 3 = XP Servo communication error
- 4 = End of travel fault
- 5 = Overforce fault
- 6 = Velocity error
- 7 = Base fault
- 8 = Gripper fault
- 9 = Robot cannot sign on
- 10 = Robot version is not available
- 11 = Invalid robot command
- 12 = Command is not for this robot
- 13 = Memory request denied (insufficient memory)
- 14 = Dictionary entry does not exist
- 15 = Dictionary entry already exists
- 16 = Illegal rack index

EXAMPLE: ? S:MODULE.STATUS
0

NAME: **S:ERROR.DESRIPTION**

SYNTAX: ? S:ERROR.DESRIPTION

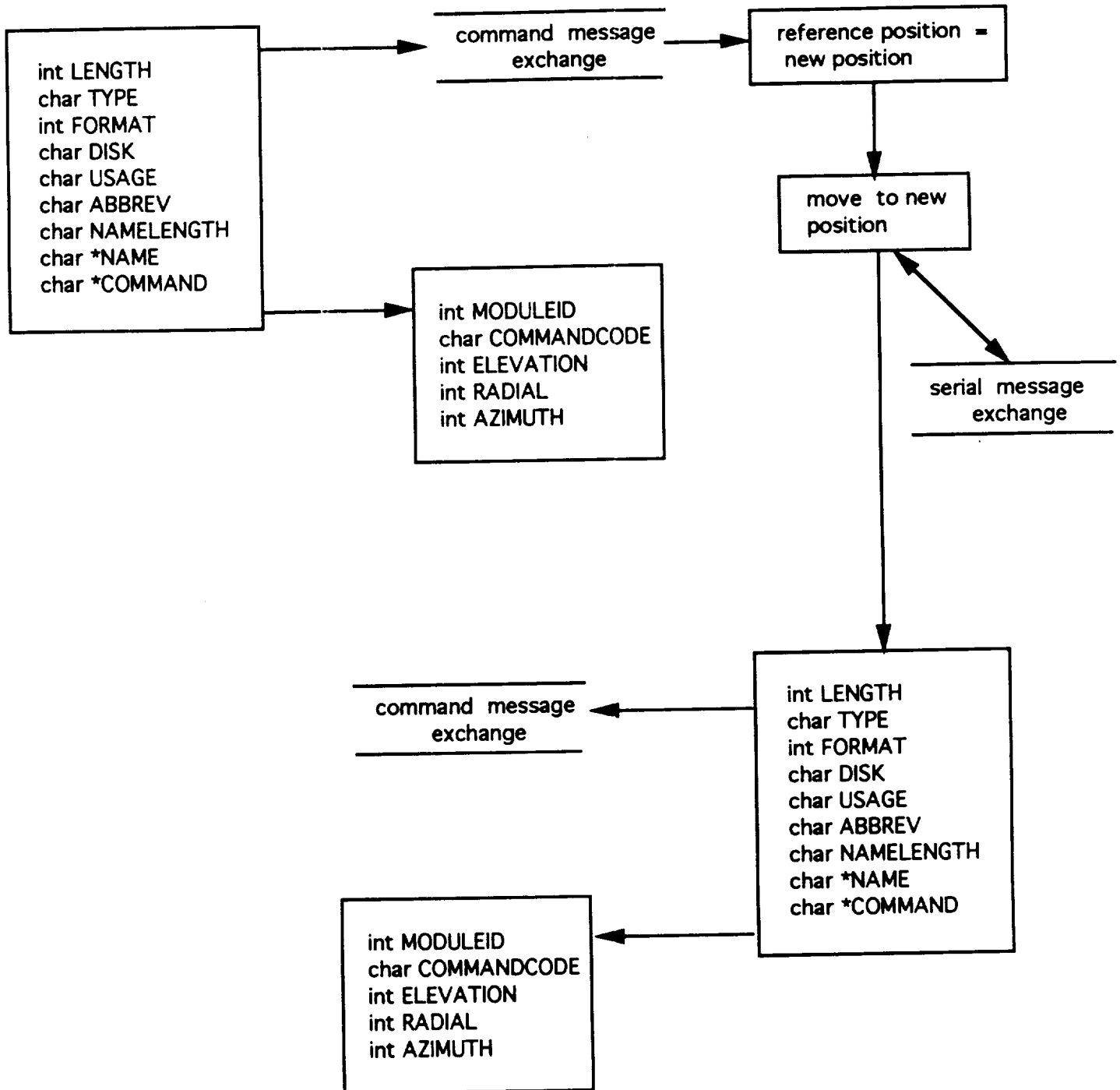
DESCRIPTION: ERROR DESCRIPTION COMMAND
 COMMANDCODE #101

Return a description of the last error.

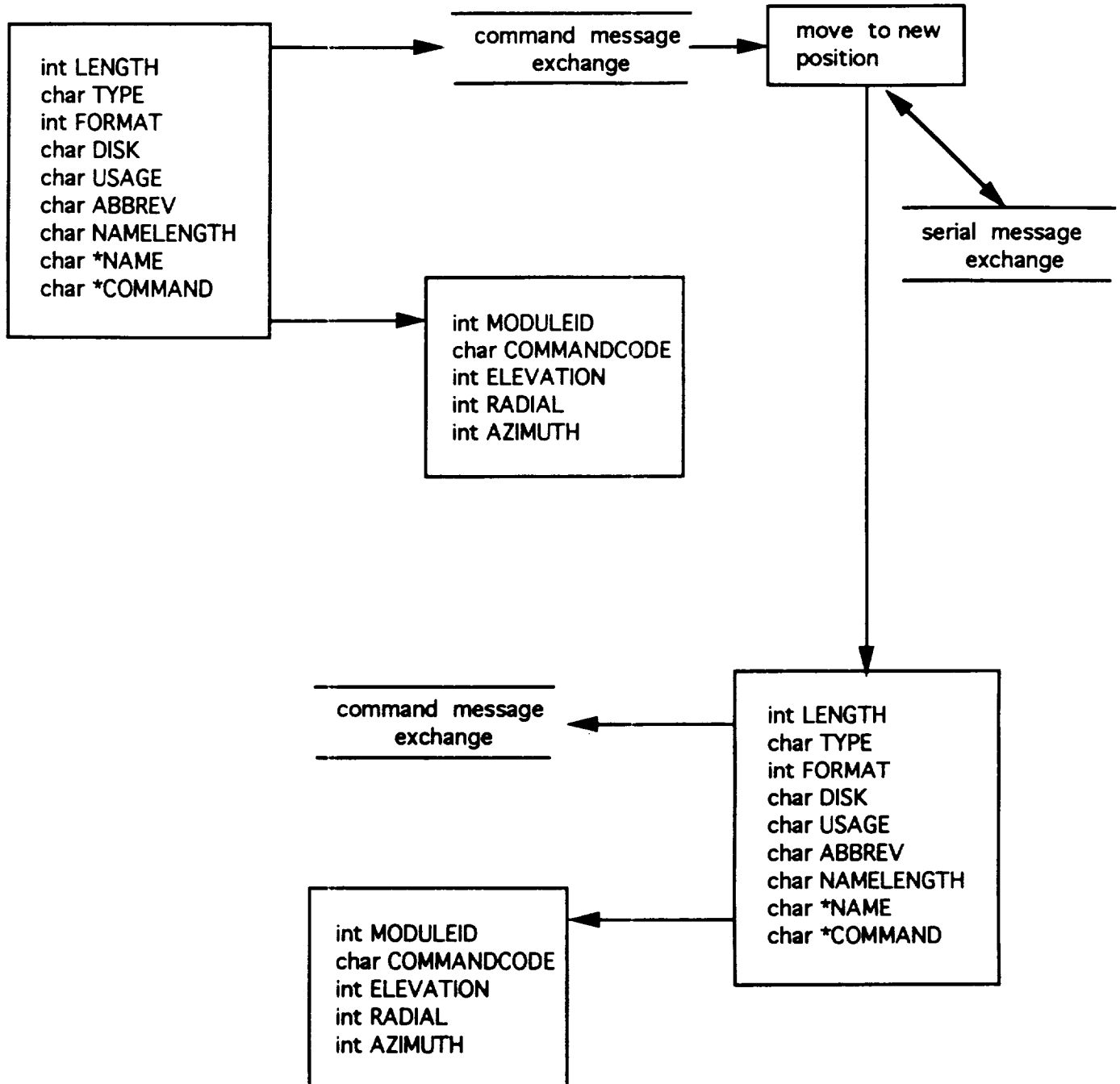
EXAMPLE: ? S:ERROR.DESRIPTION
NOT IN POSITION

**ROBOT
EASYPYLAB COMMANDS
FLOW CHARTS**

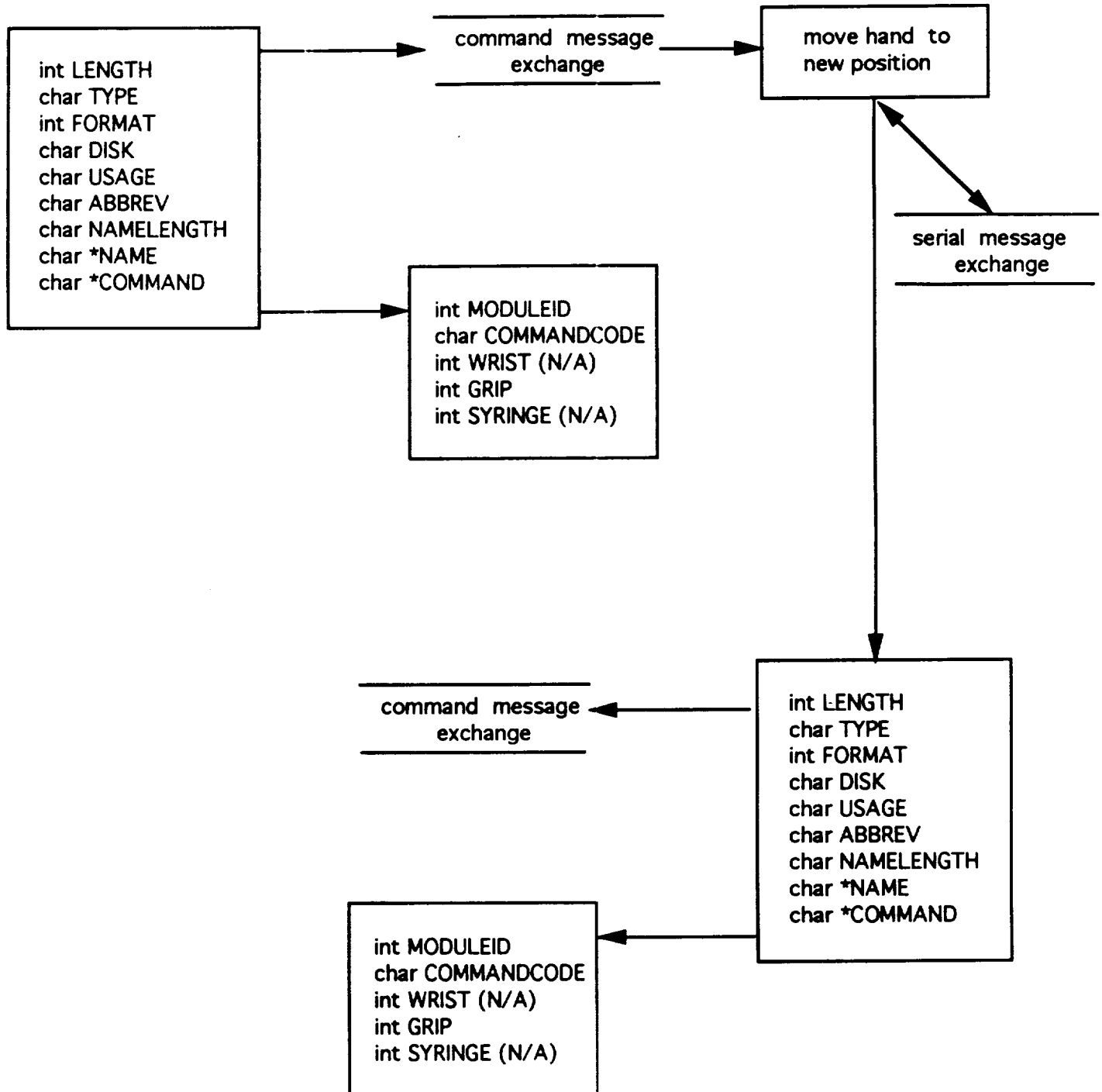
ABSOLUTE POSITION COMMANDCODE #1



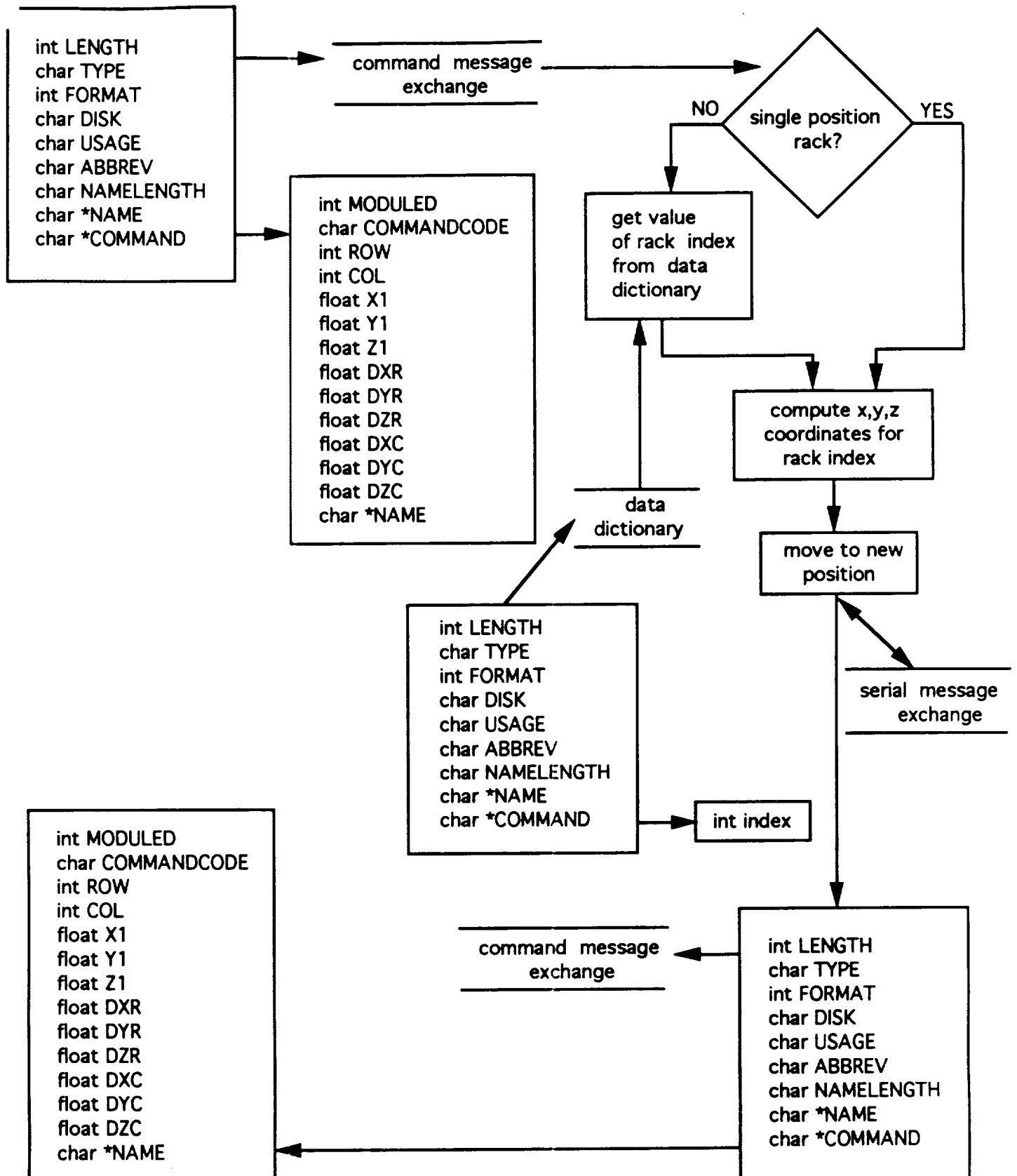
RELATIVE POSITION
COMMANDCODE #2

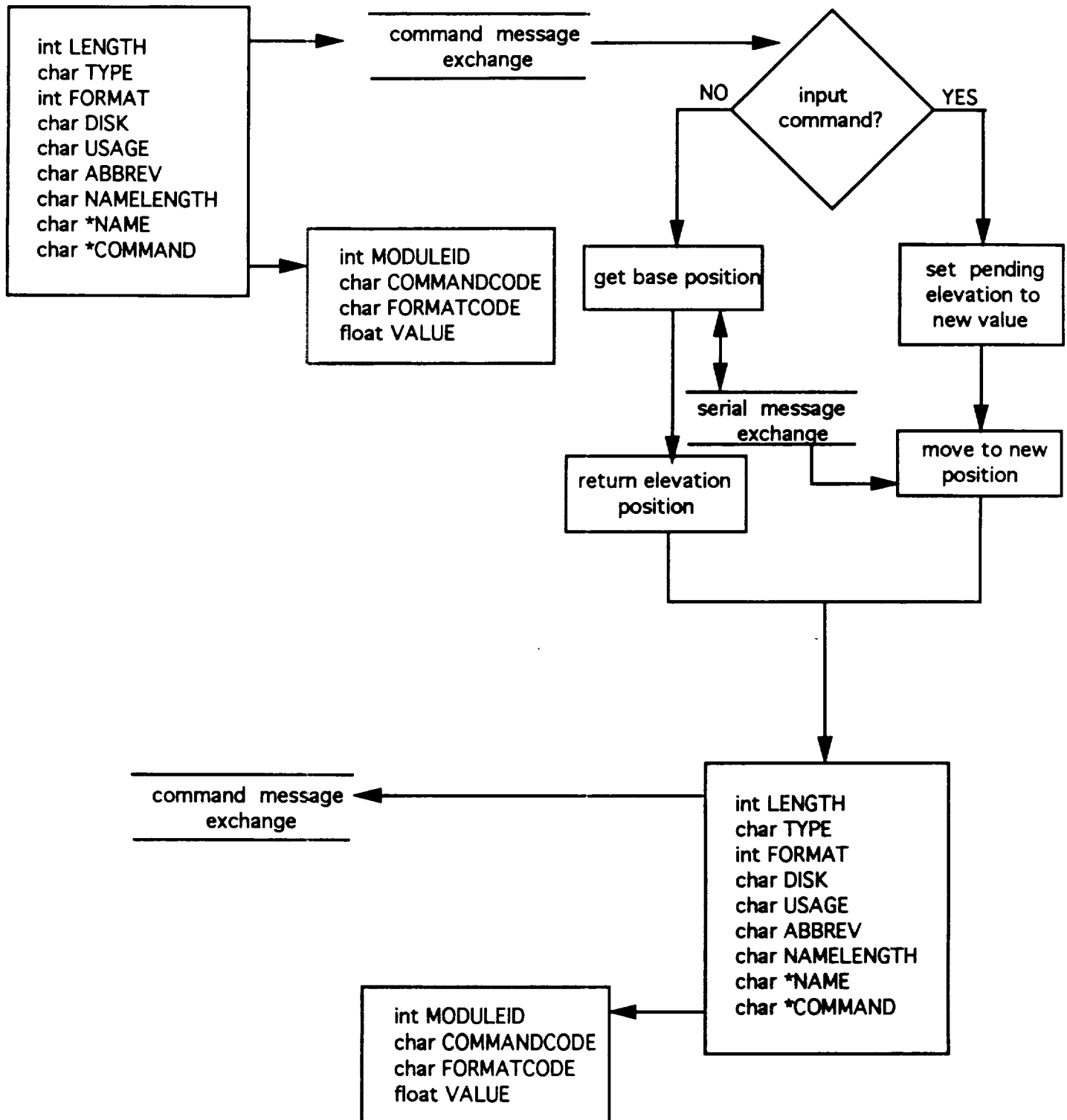


HAND LOCATION COMMANDCODE #3

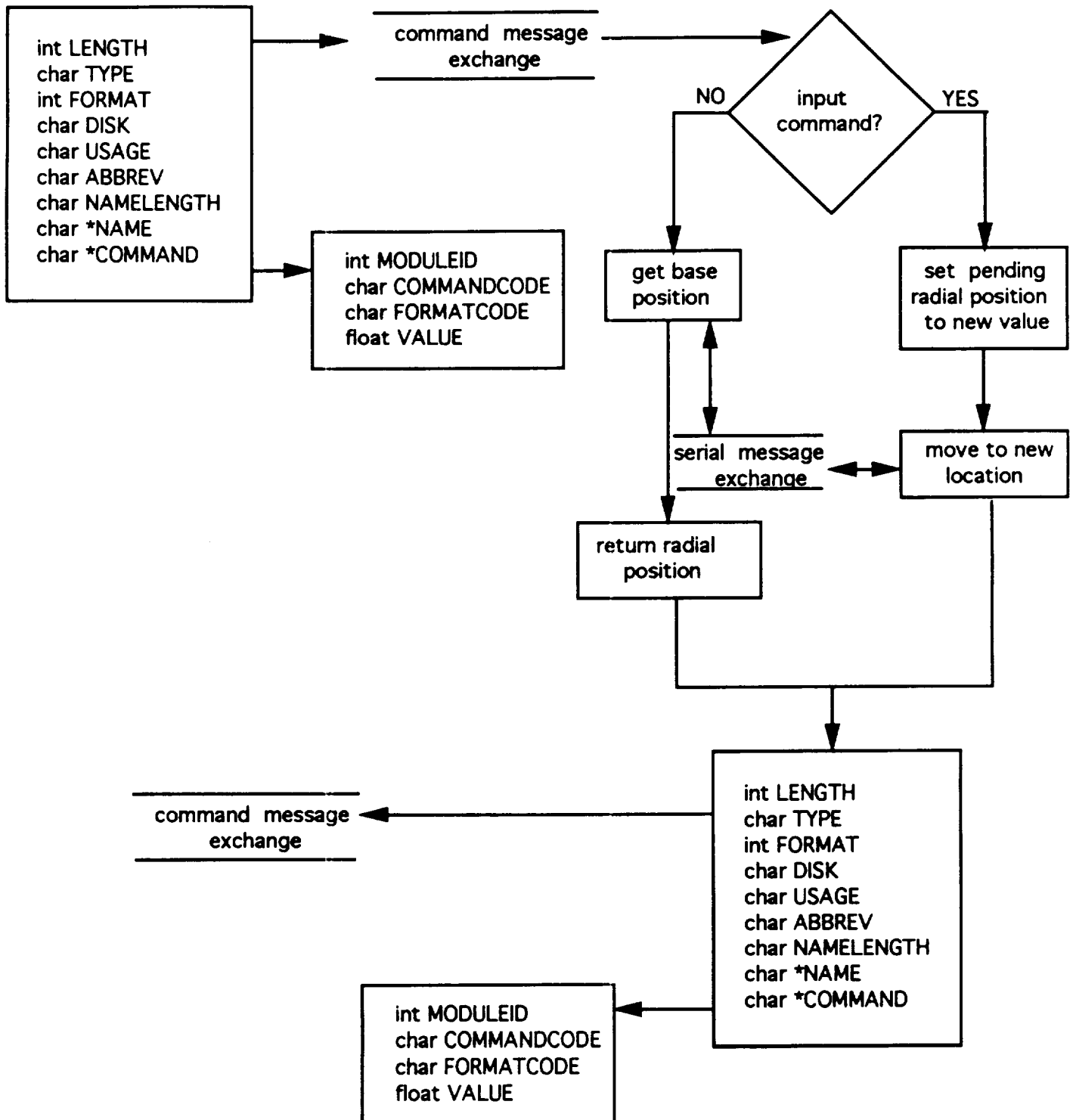


RACK POSITION COMMANDCODE #4

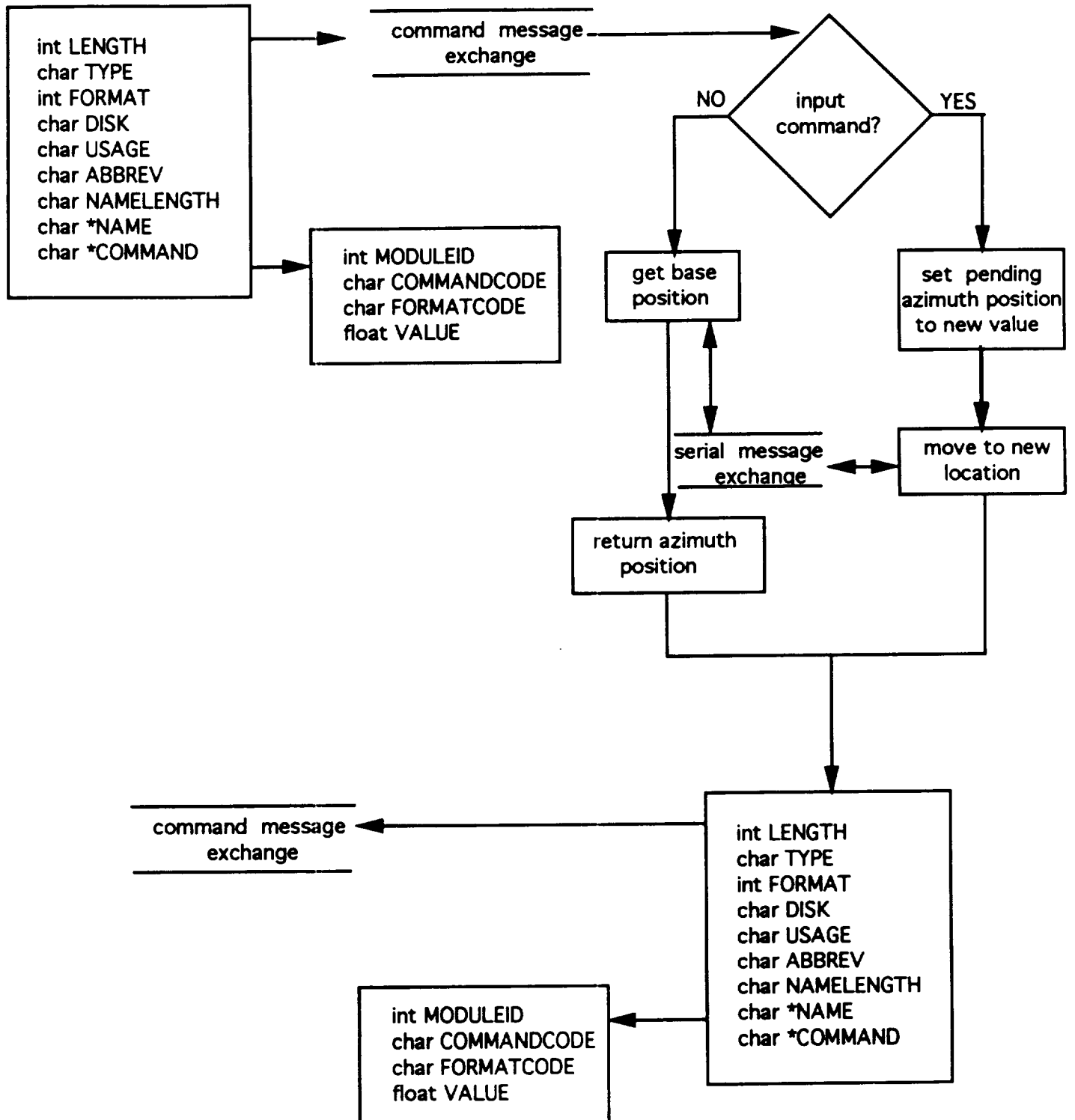


ELEVATION POSITION COMMAND VARIABLE
COMMANDCODE #9

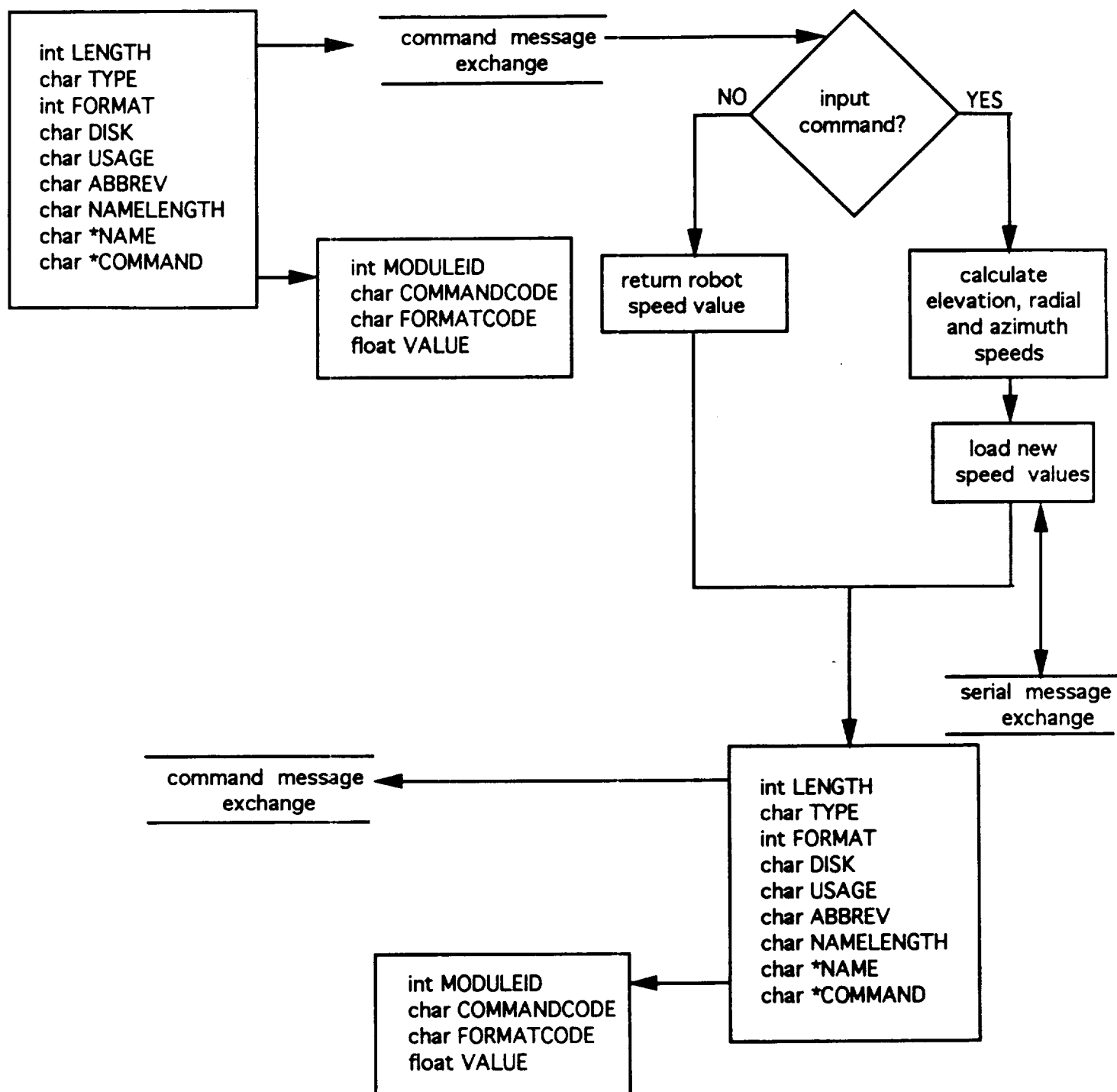
RADIAL POSITION COMMAND VARIABLE COMMANDCODE #10



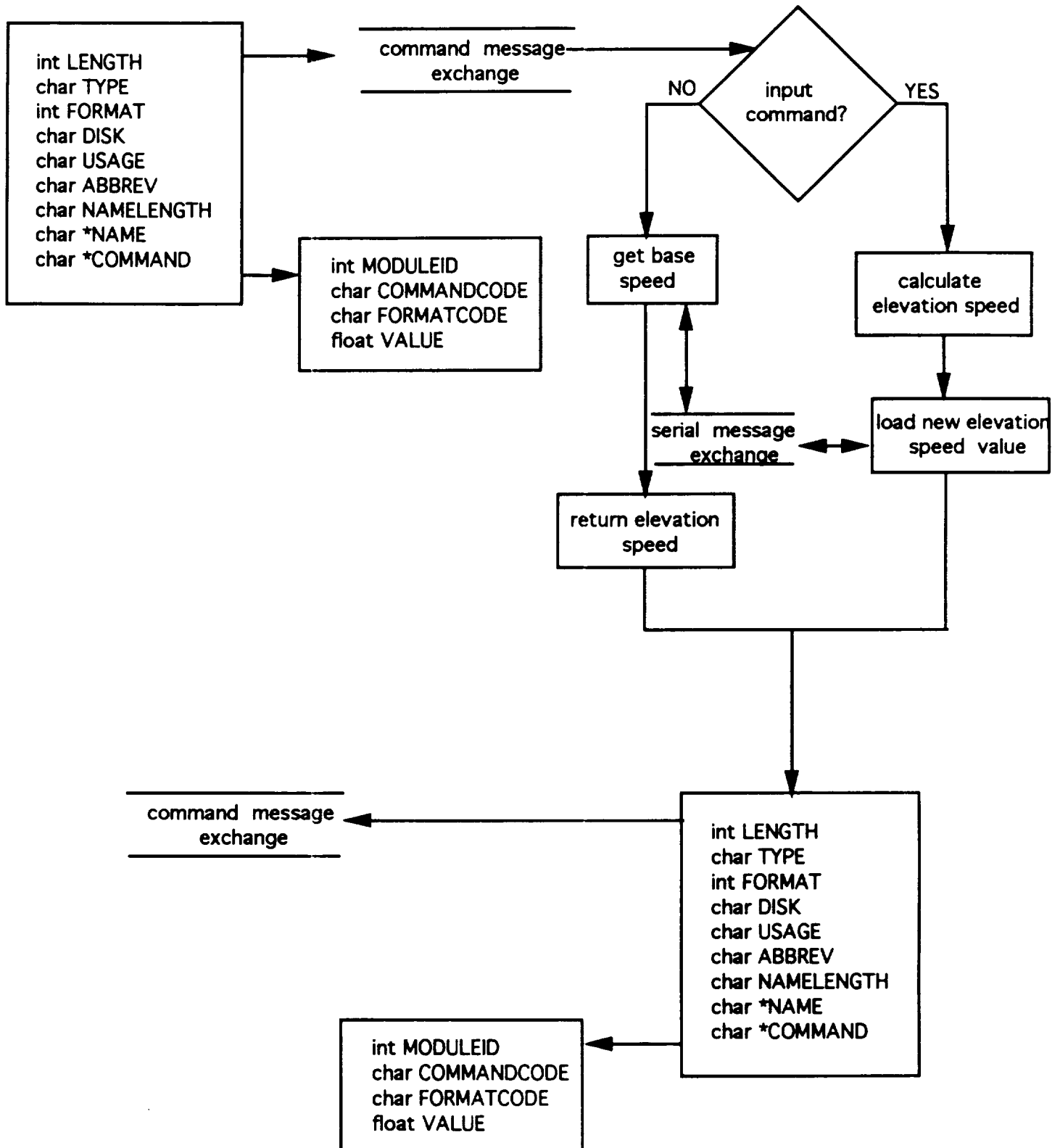
AZIMUTH POSITION COMMAND VARIABLE COMMANDCODE #11



PRECEDING PAGE BLANK NOT FILMED

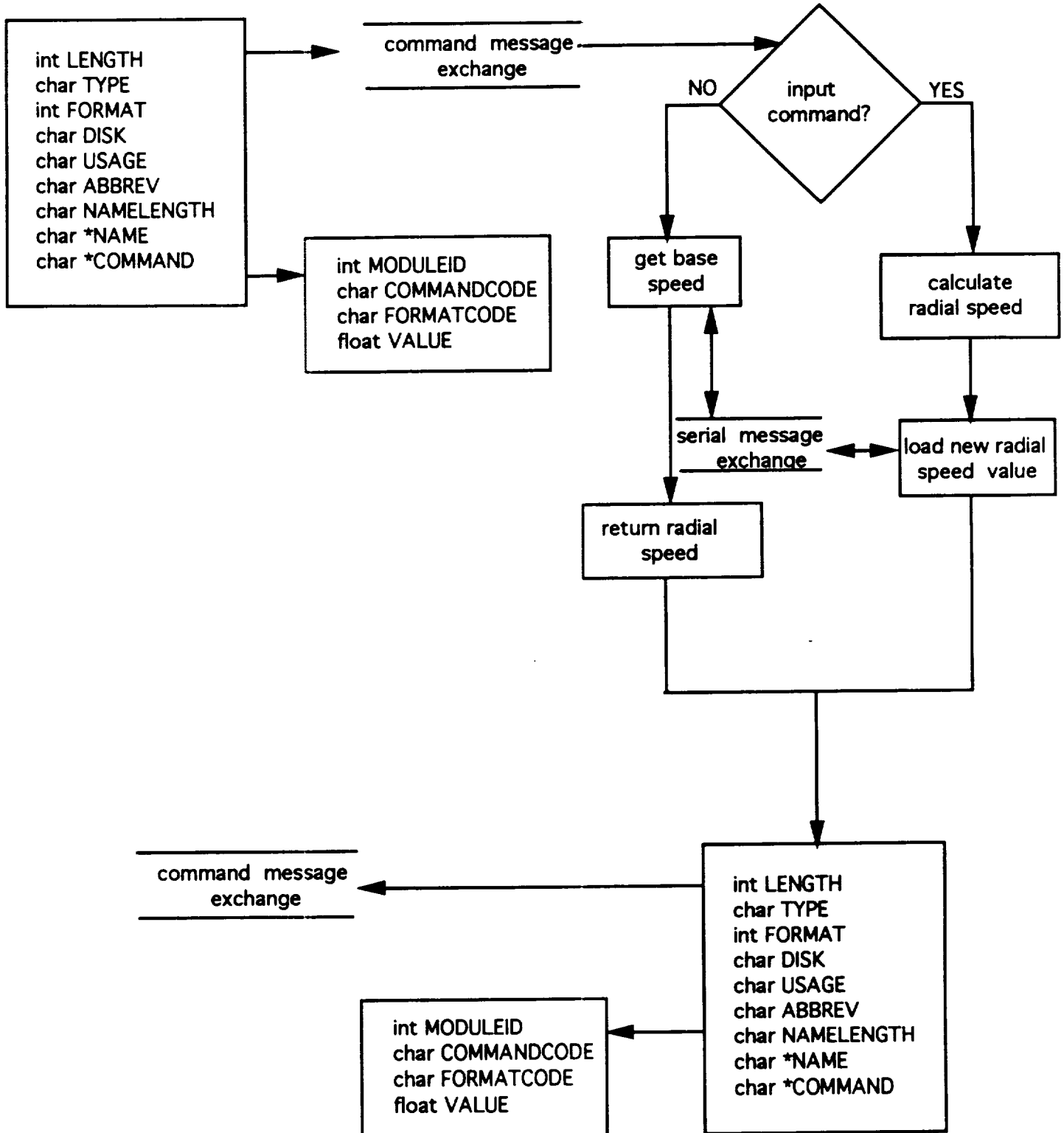


ELEVATION SPEED COMMAND VARIABLE
COMMANDCODE #16

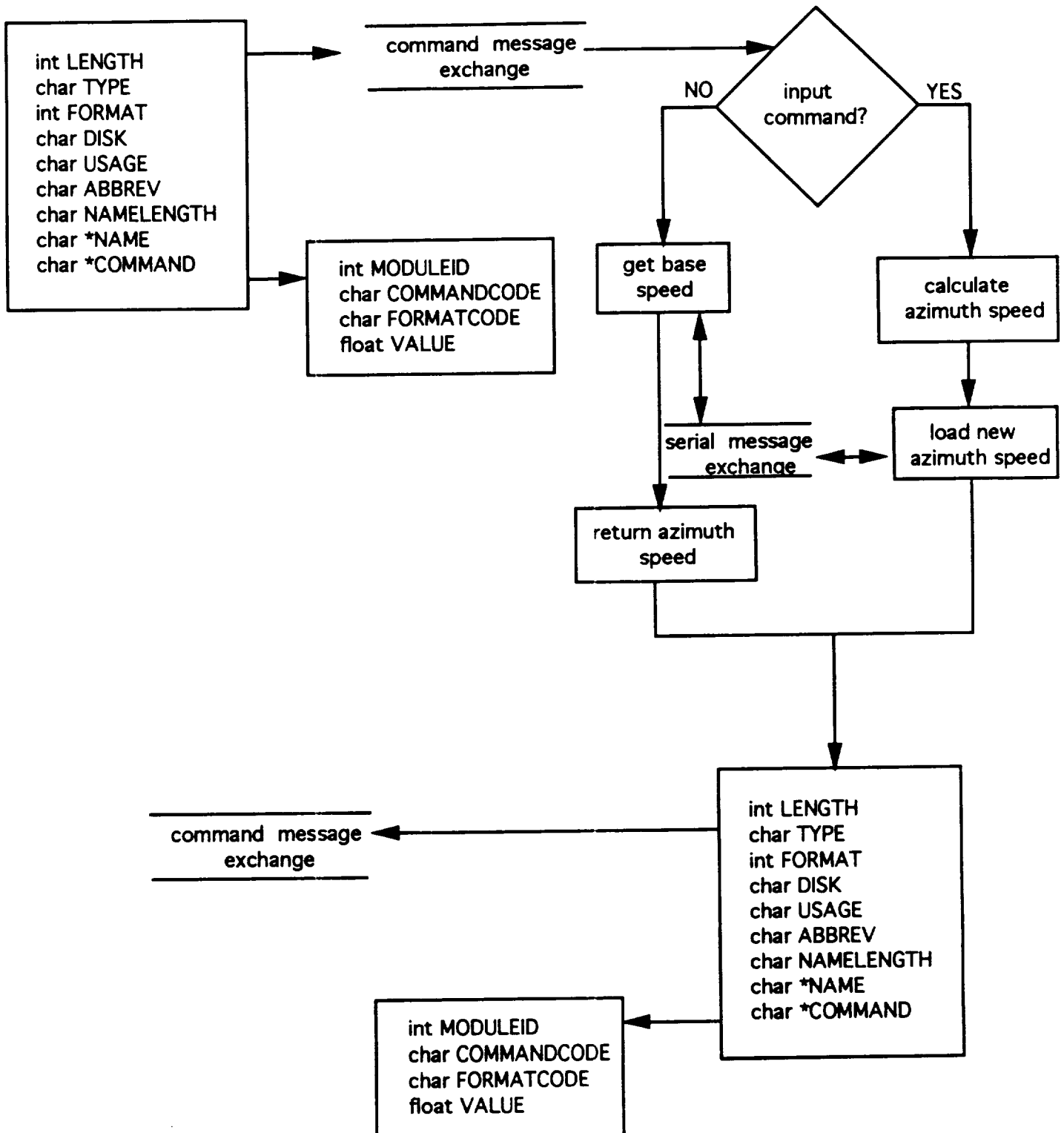


RADIAL SPEED COMMAND VARIABLE COMMANDCODE #17

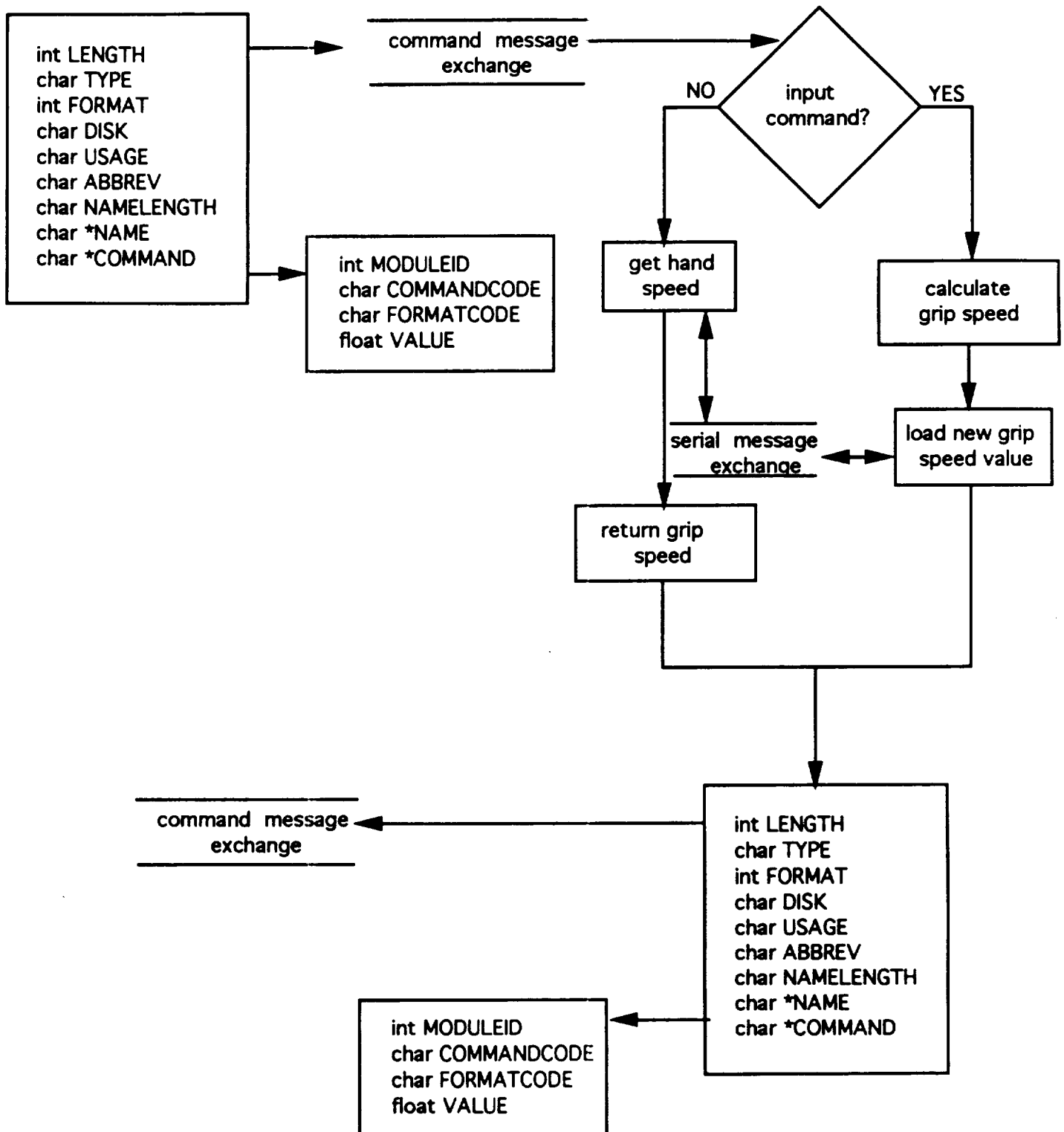
RECORDING NAME BLANK NOT FILMED



AZIMUTH SPEED COMMAND VARIABLE COMMANDCODE #18

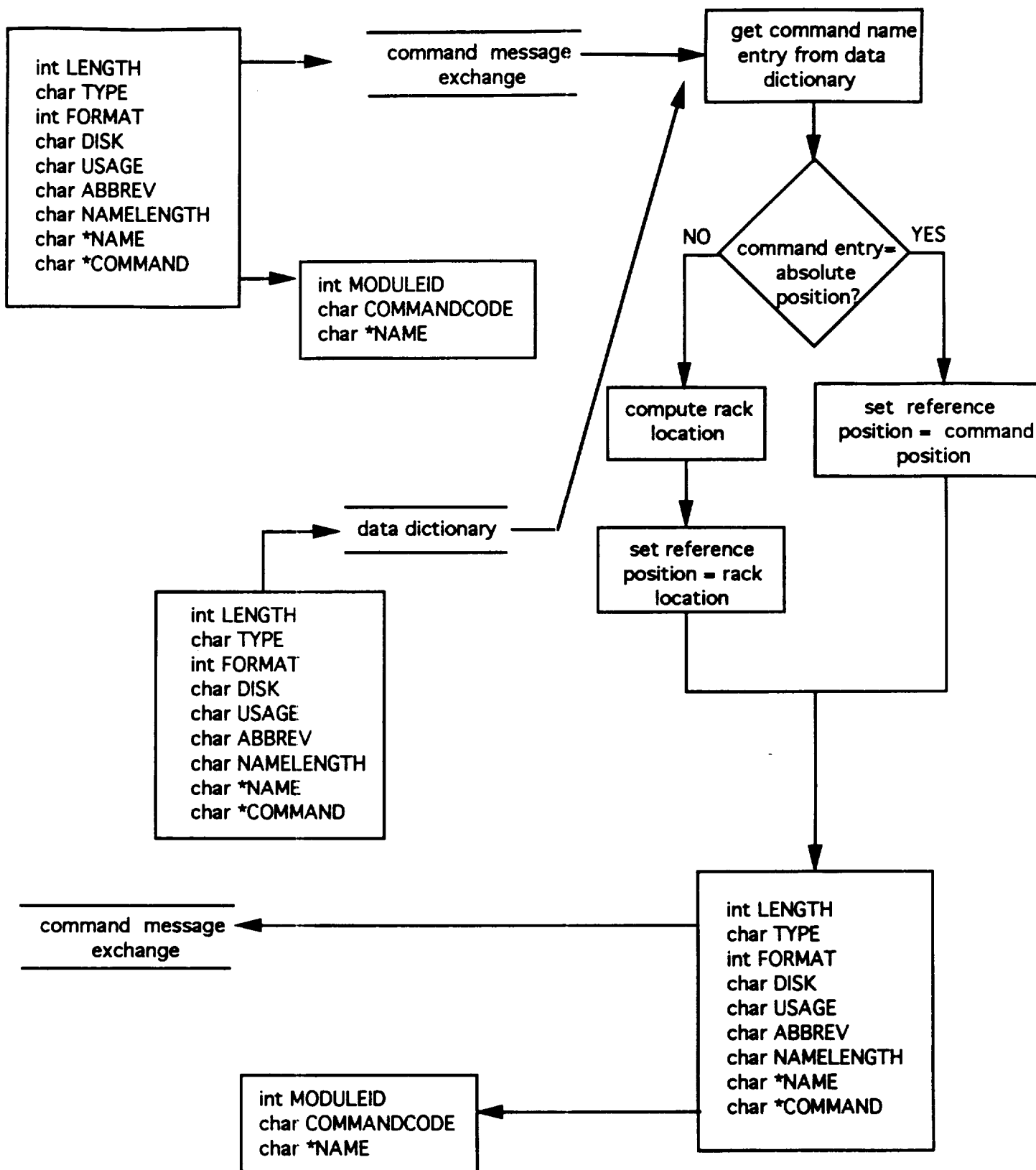


GRIP SPEED COMMAND VARIABLE COMMANDCODE #20



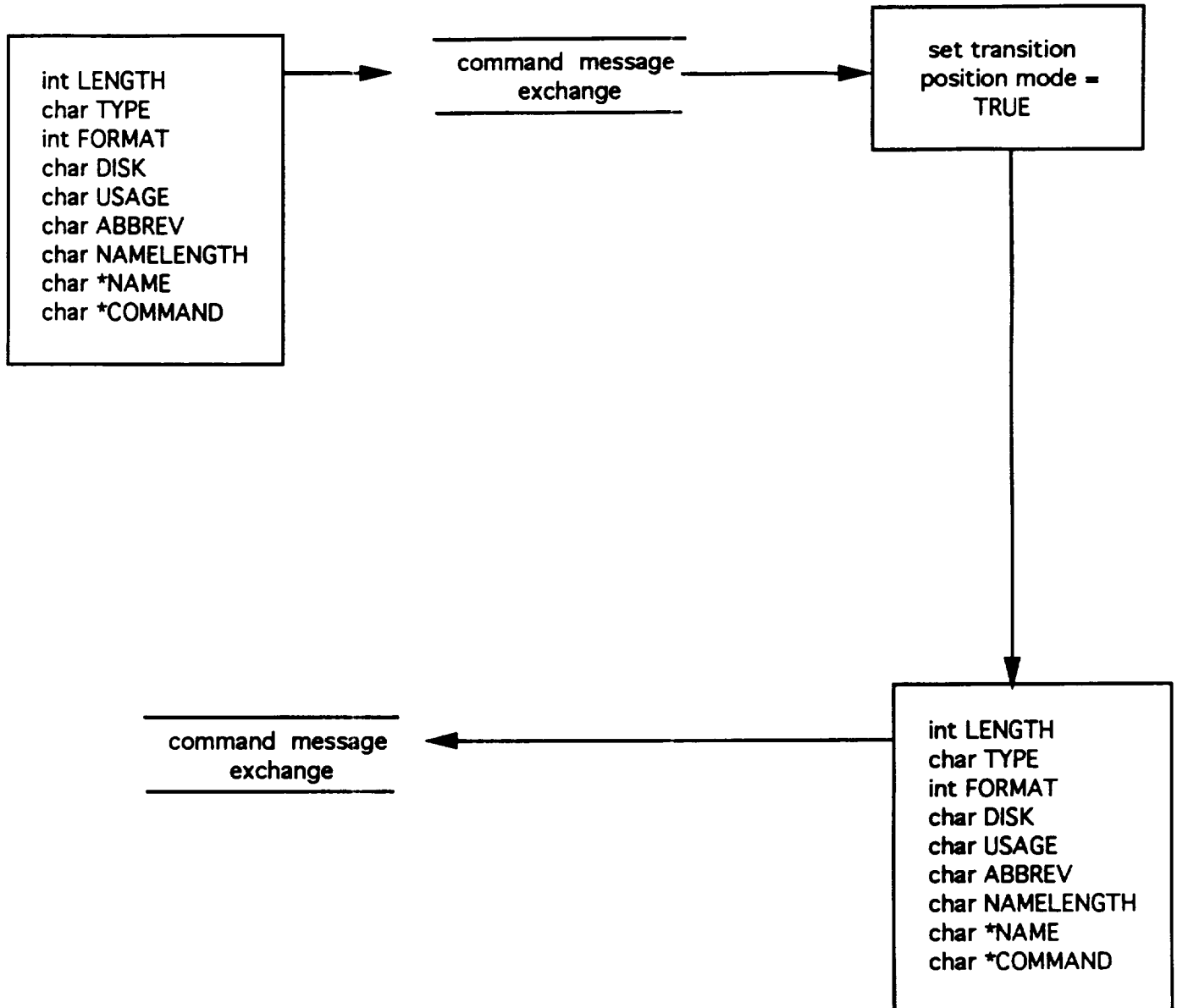
SET ABSOLUTE COMMAND VARIABLE COMMANDCODE #28

PRECEDING PAGE PLEASE NOT FILLED

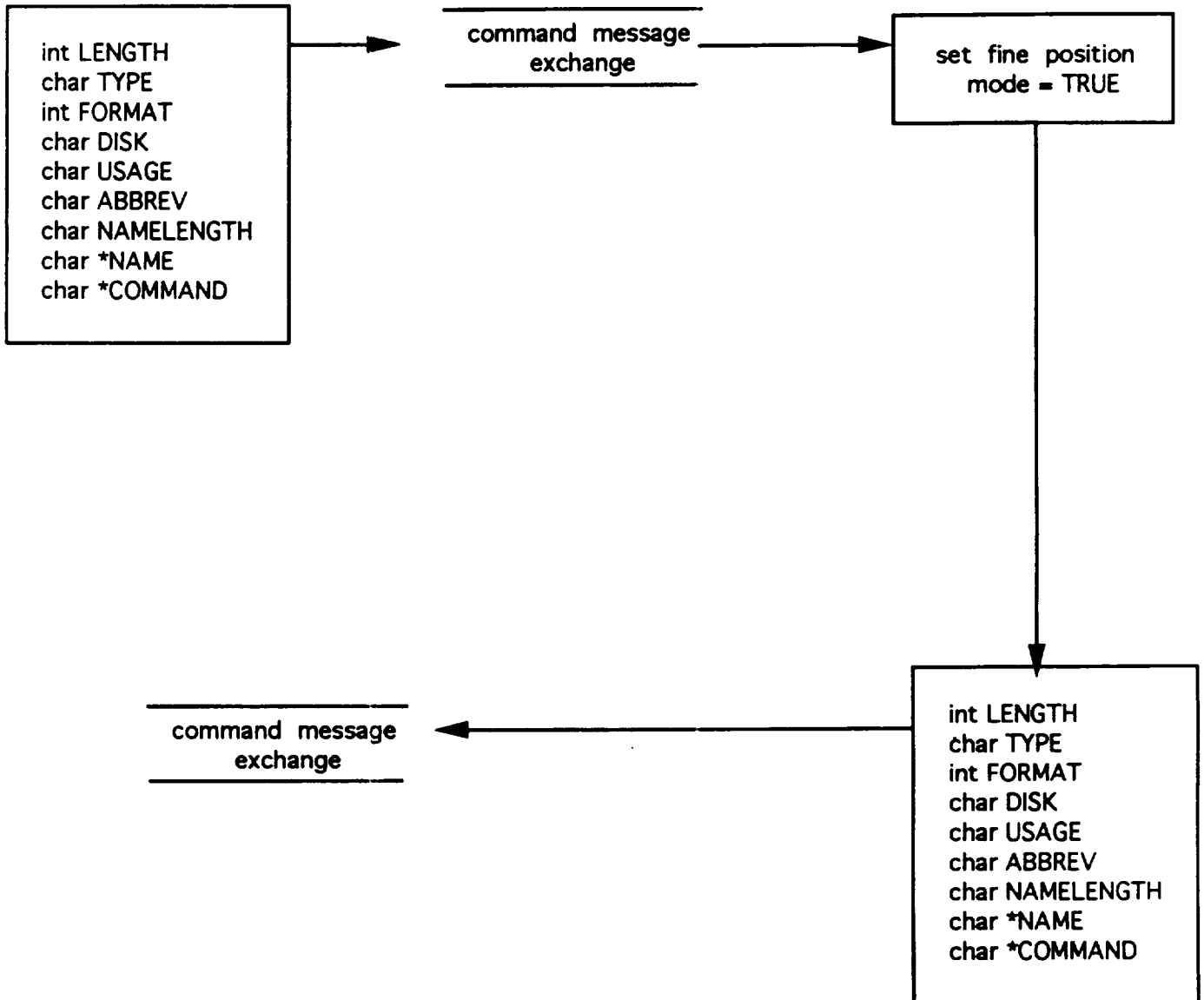


TRANSITION POSITION ON COMMAND
COMMANDCODE #31

PRECEDING PAGE PLANK NOT FILMED

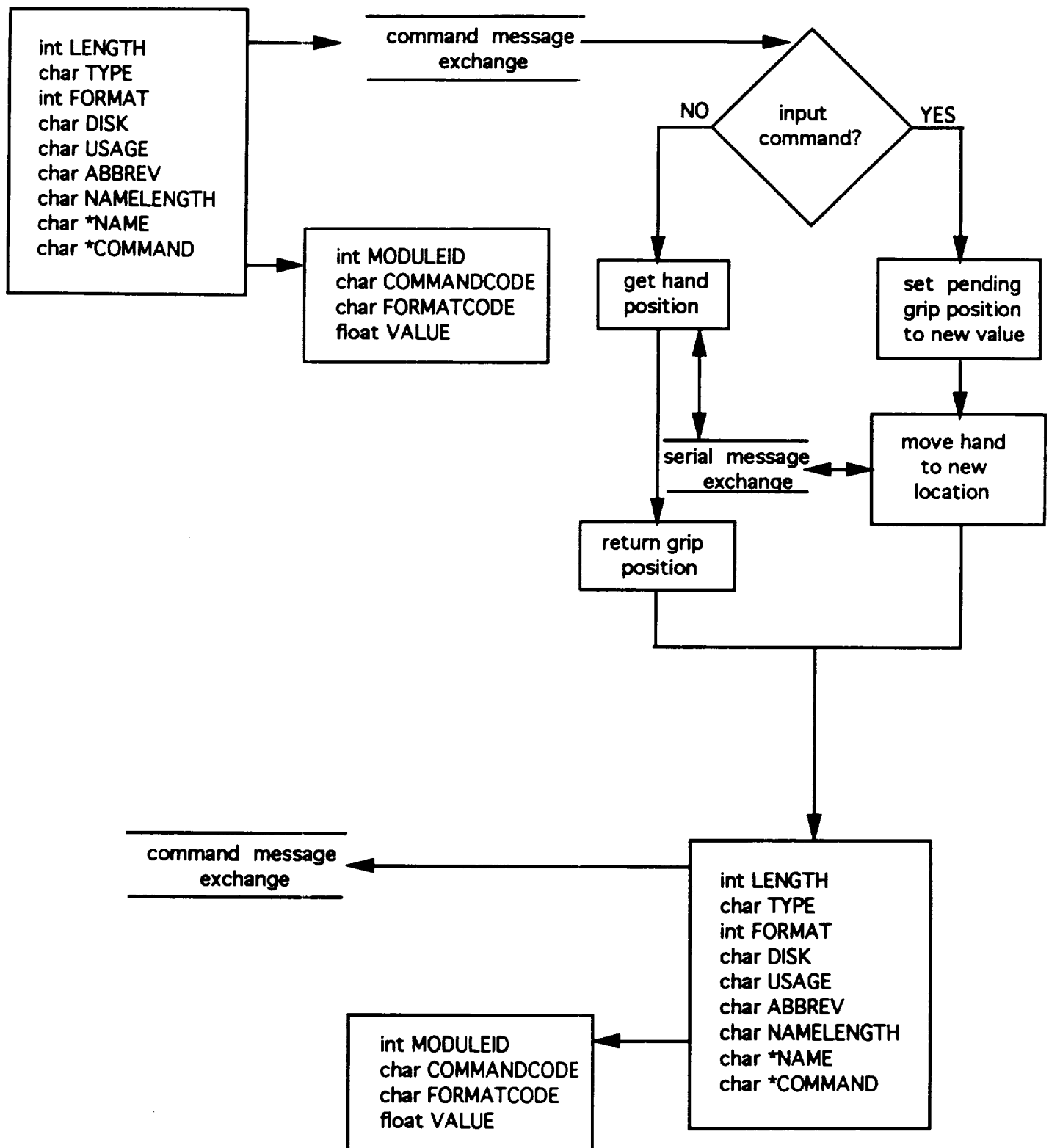


TRANSITION POSITION OFF COMMAND
COMMANDCODE #32



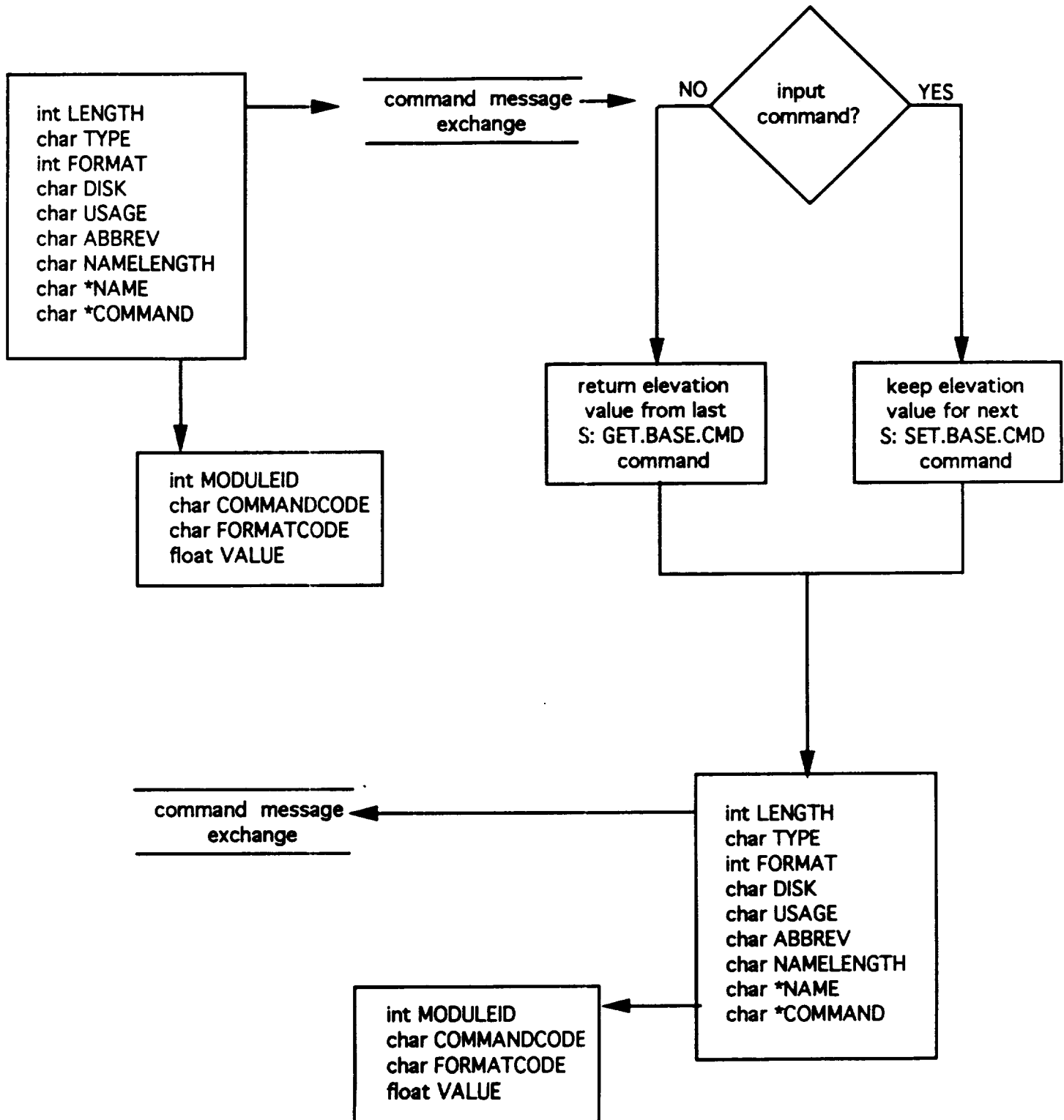
GRIP POSITION COMMAND VARIABLE COMMANDCODE #37

PRECEDING PAGE BLANK NOT FILLED

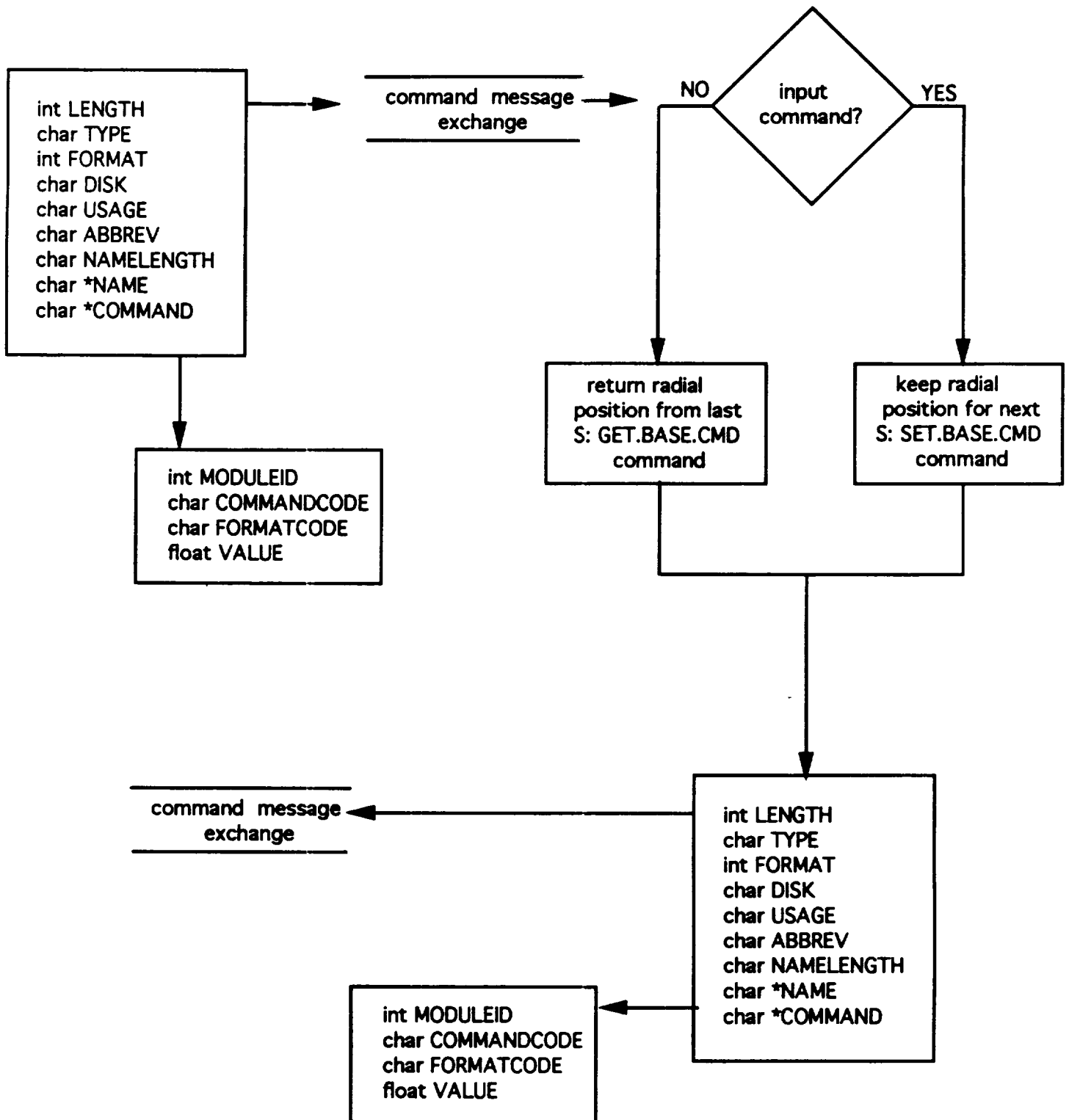


COMMAND VARIABLE ELEVATION POSITION
COMMANDCODE #50

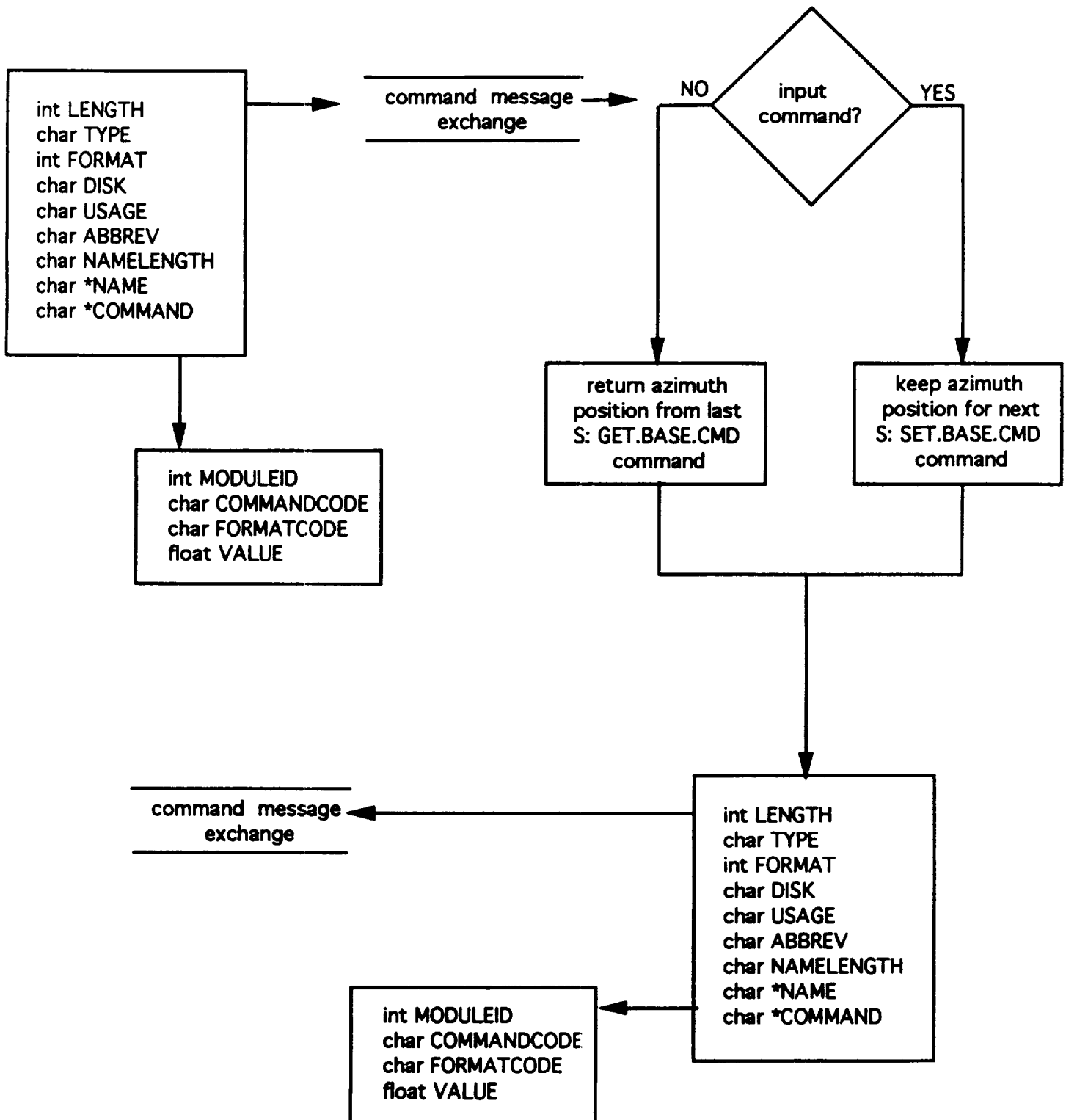
PRECEDING PAGE BLANK NOT FILMED



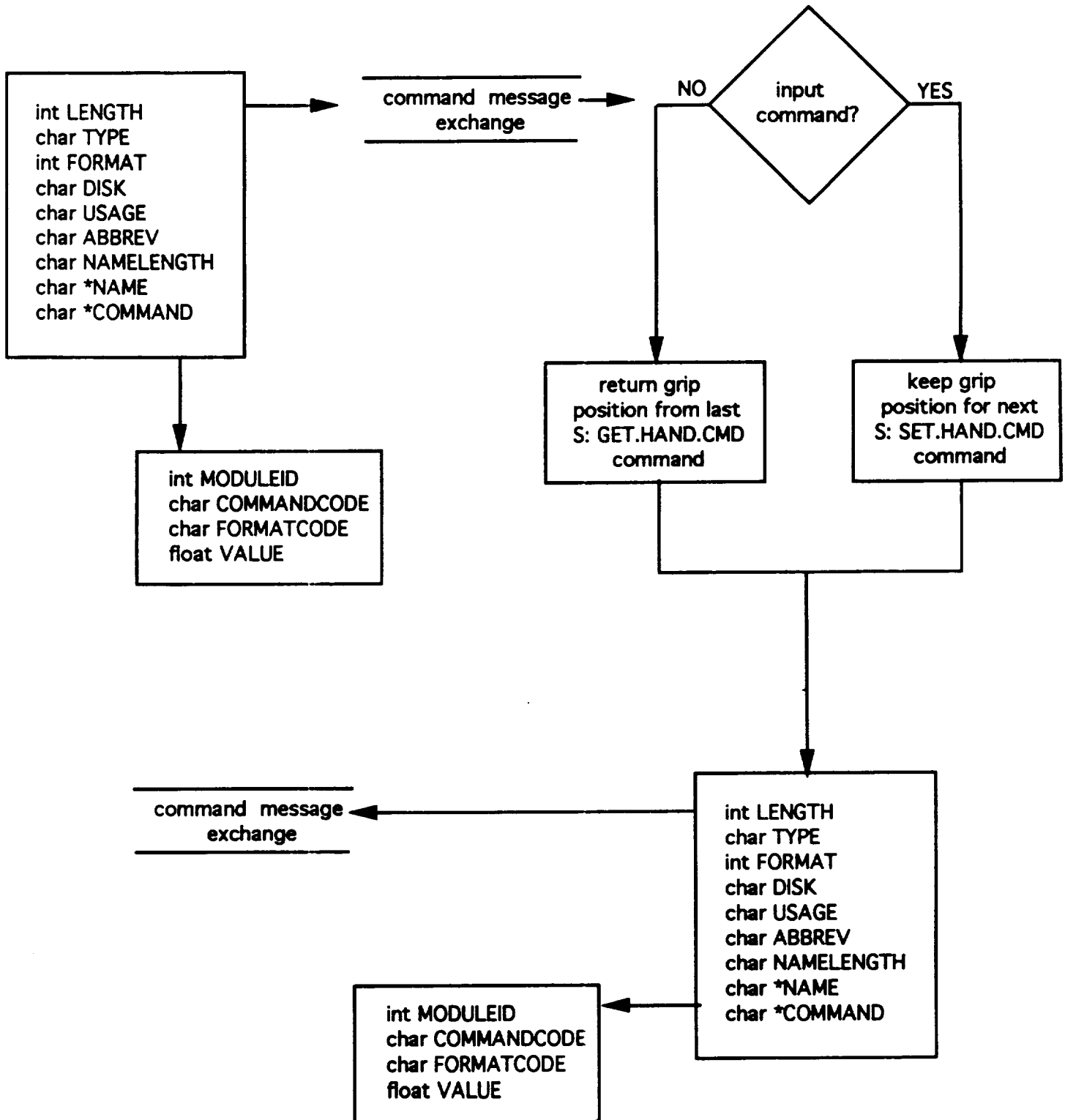
COMMAND VARIABLE RADIAL POSITION
COMMANDCODE #51



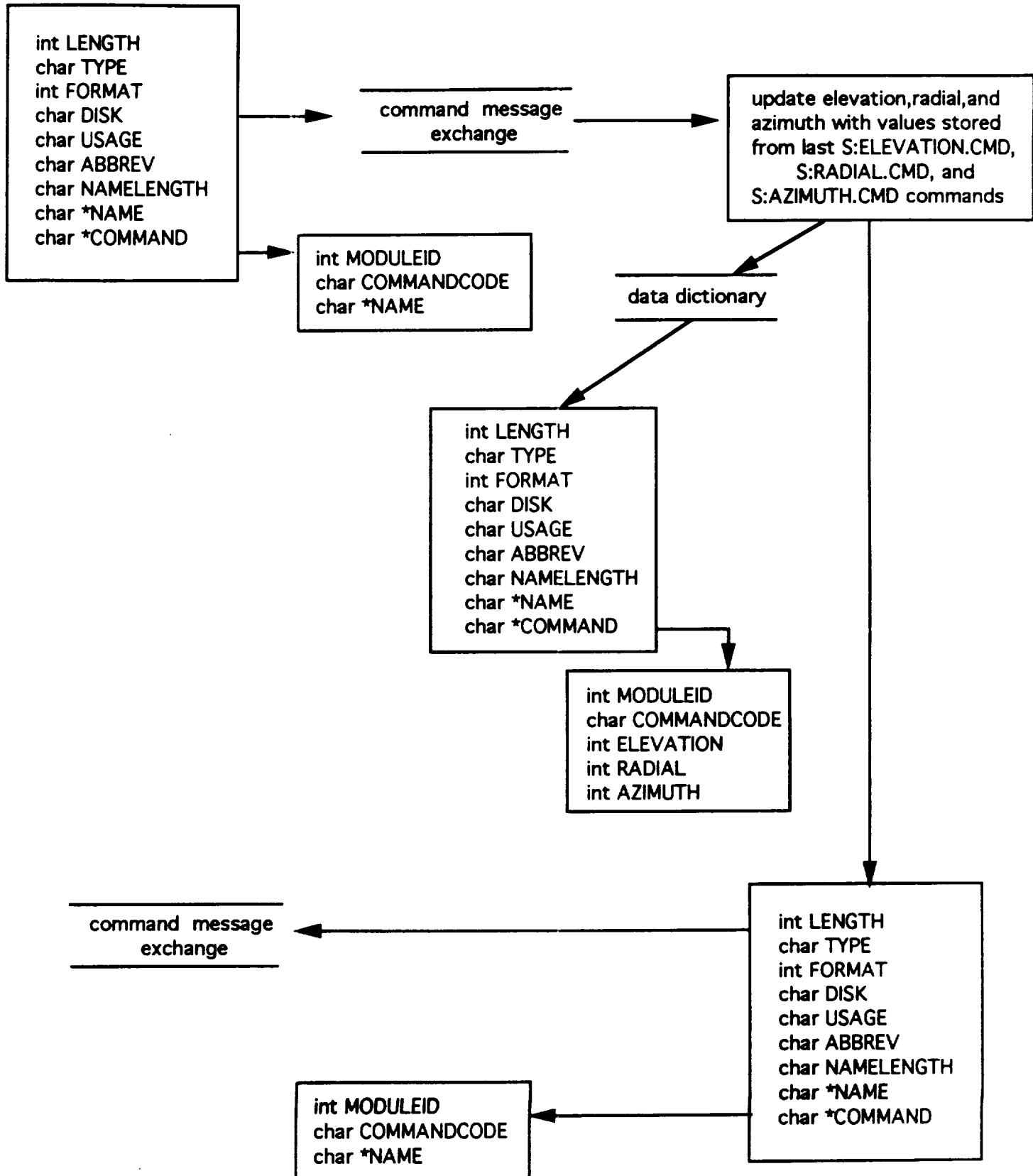
COMMAND VARIABLE AZIMUTH POSITION
COMMANDCODE #52



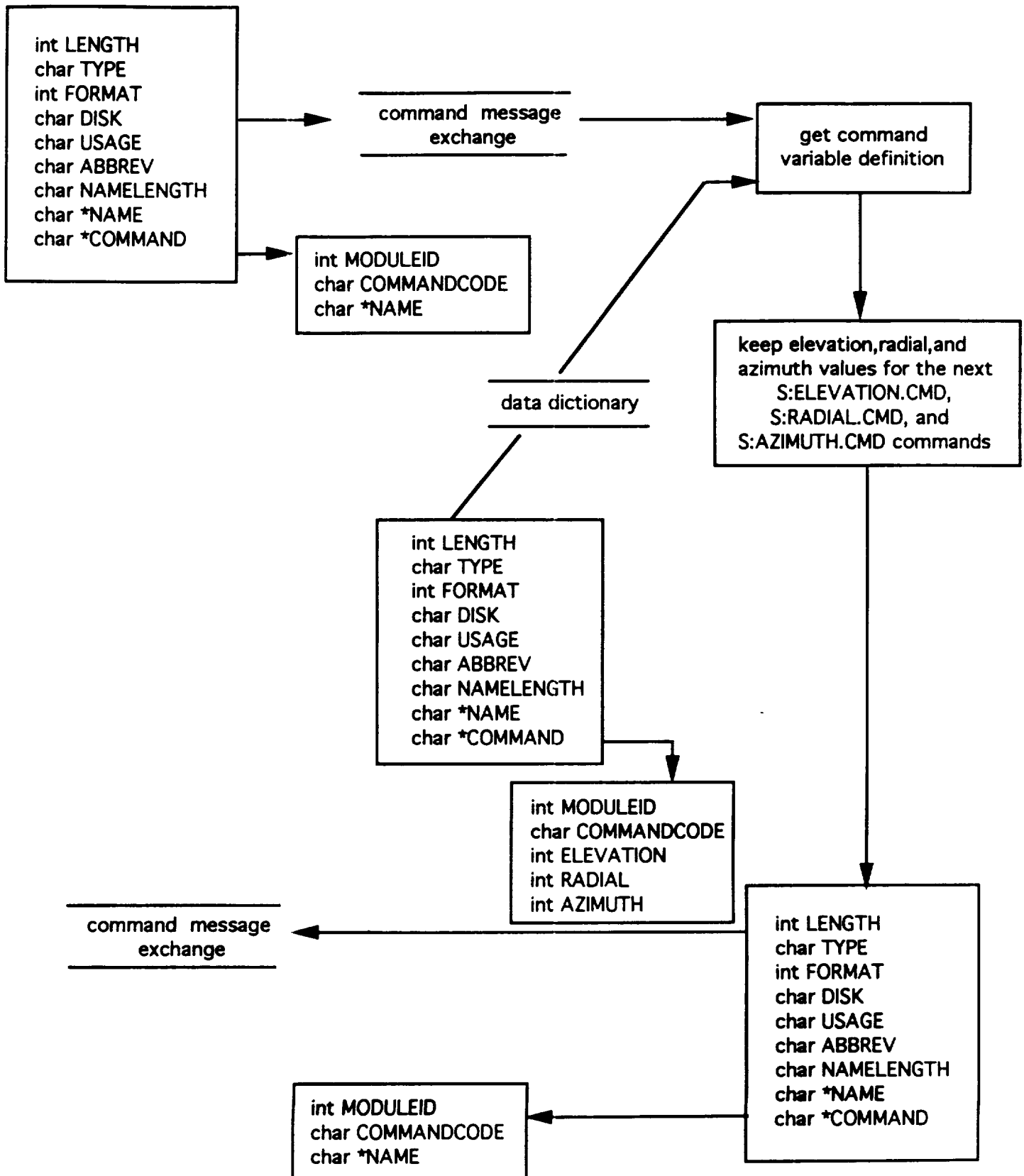
COMMAND VARIABLE GRIP POSITION
COMMANDCODE #53



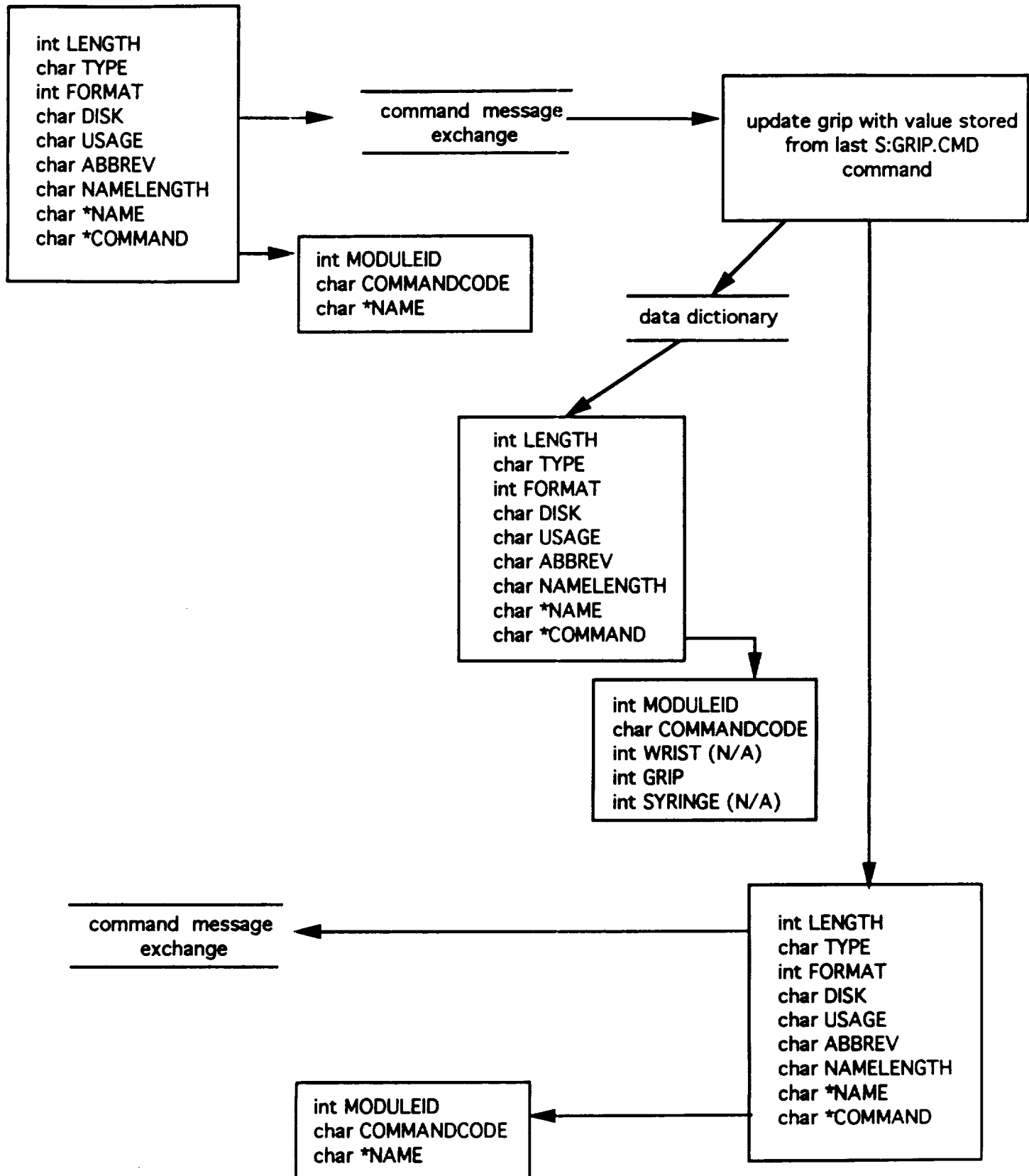
SET BASE COMMAND VARIABLE
COMMANDCODE #54



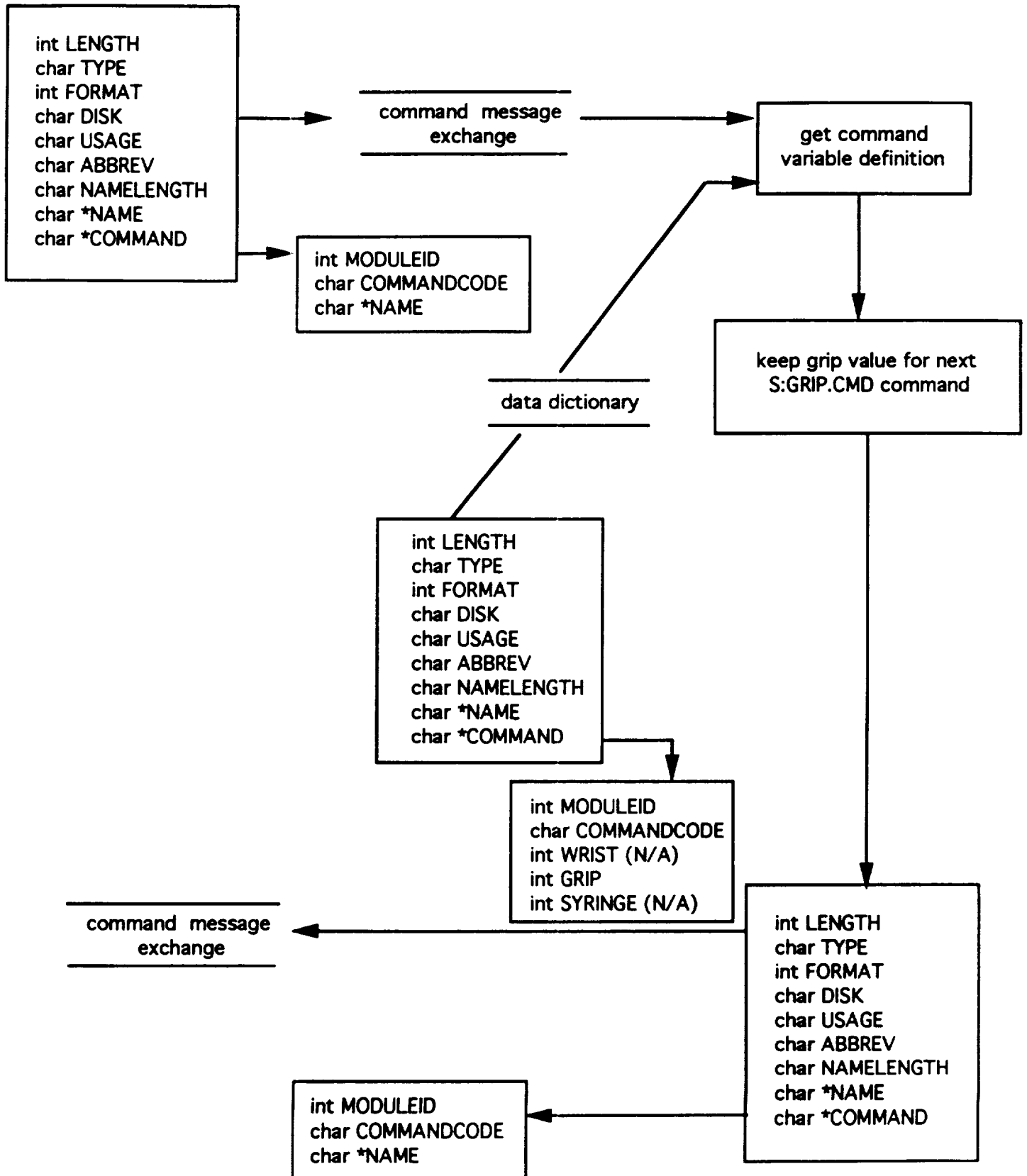
GET BASE COMMAND VARIABLE COMMANDCODE #55



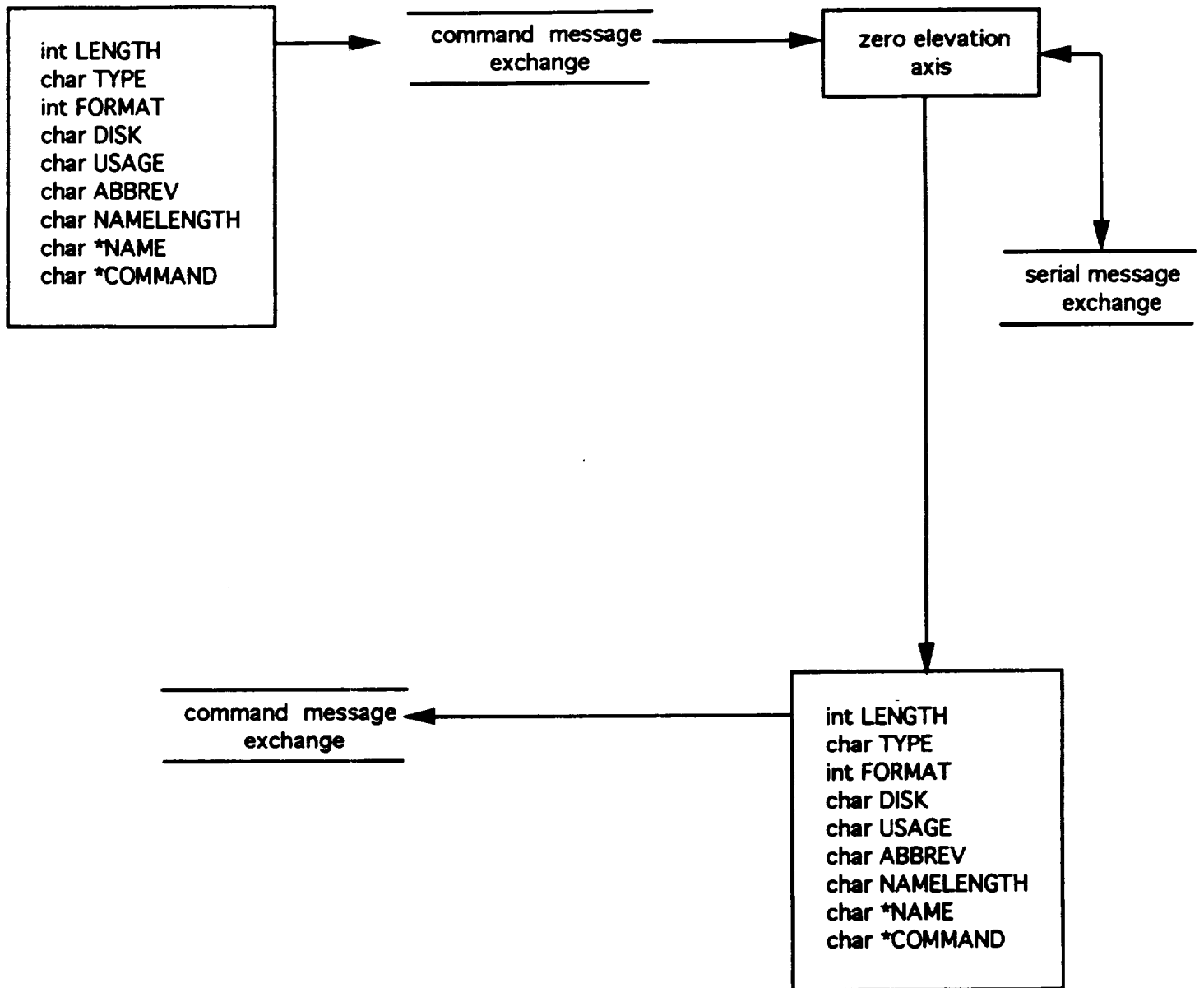
SET HAND COMMAND VARIABLE
COMMANDCODE #56



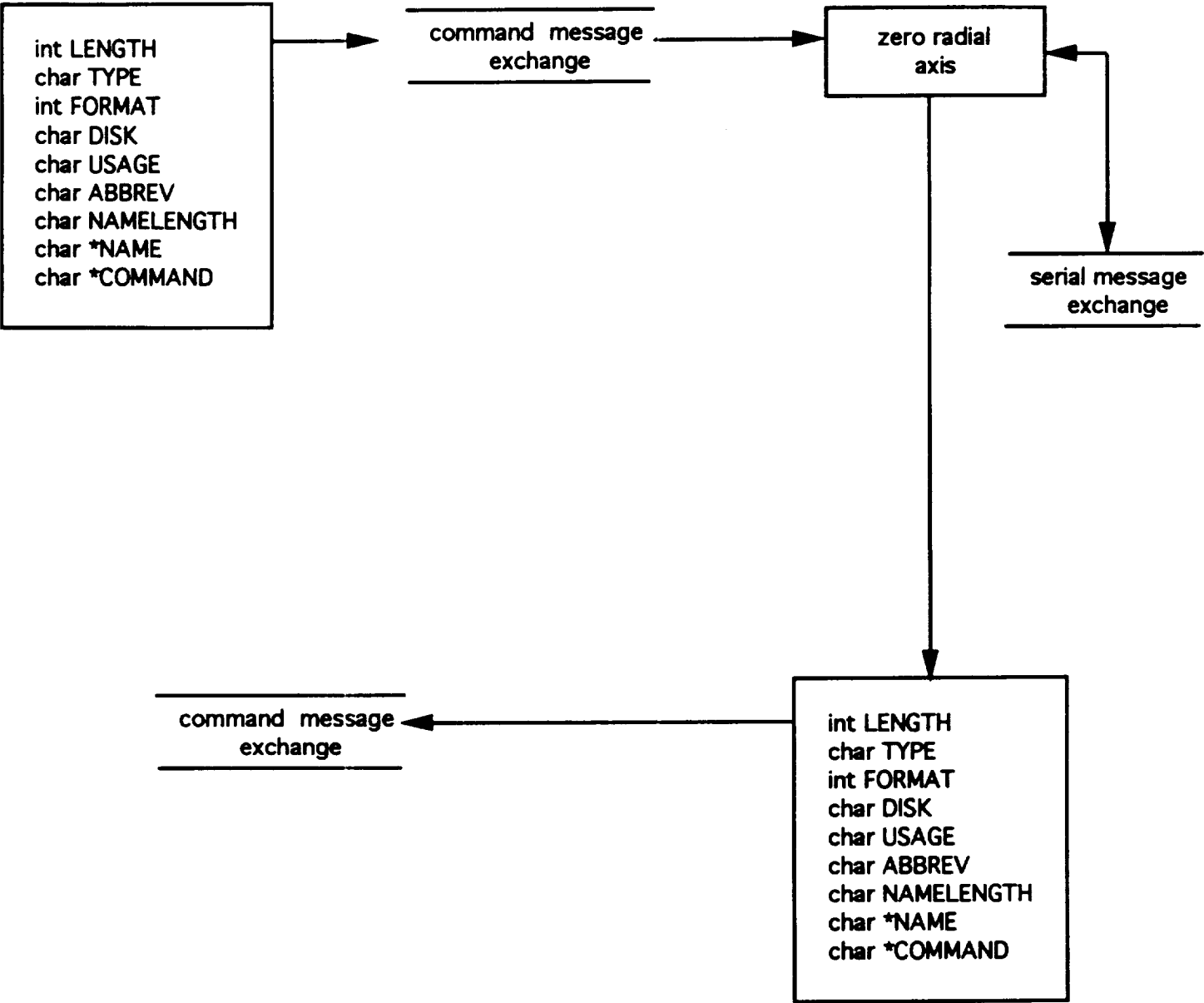
GET HAND COMMAND VARIABLE
COMMANDCODE #57



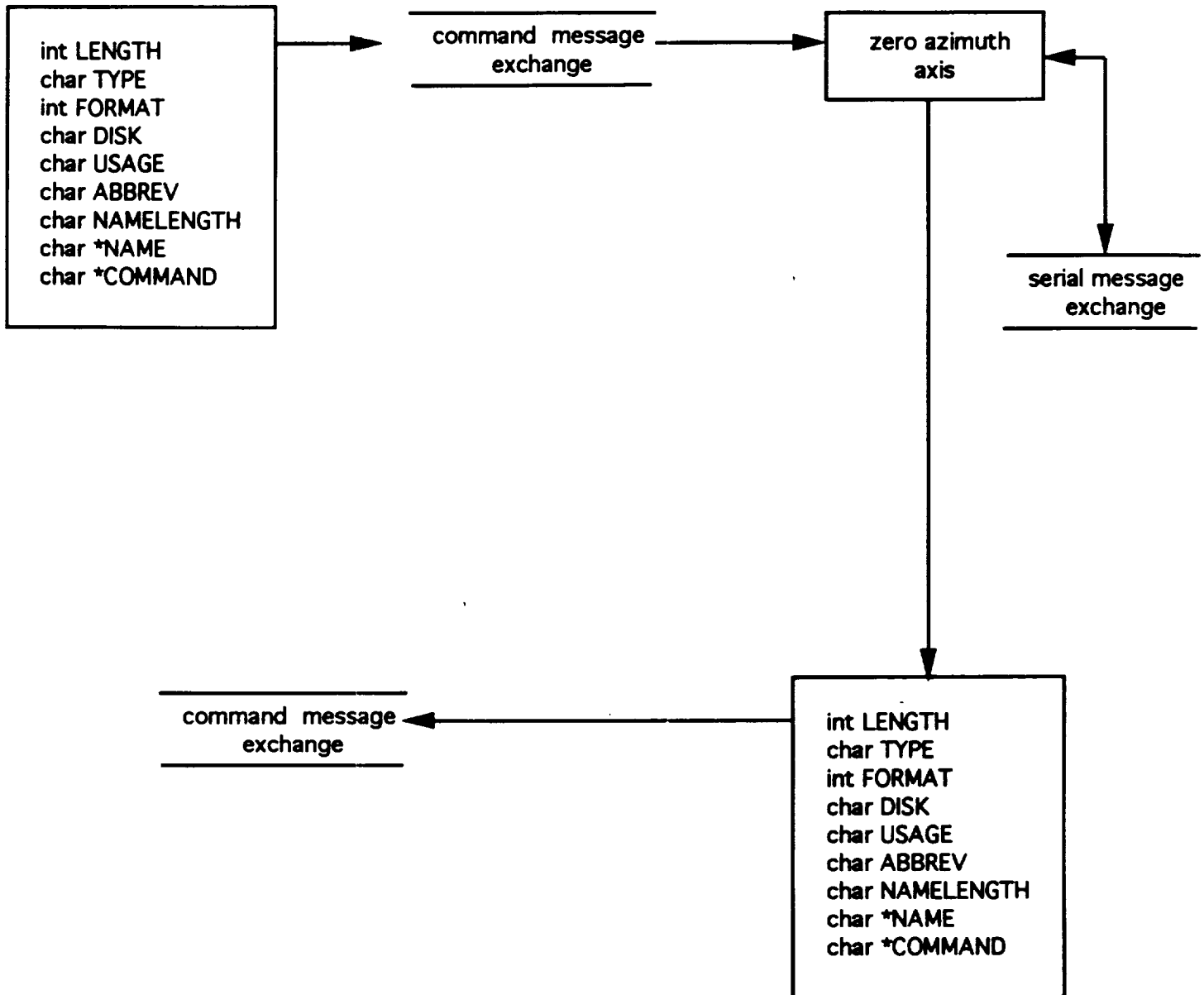
**ZERO ELEVATION AXIS
COMMANDCODE #58**



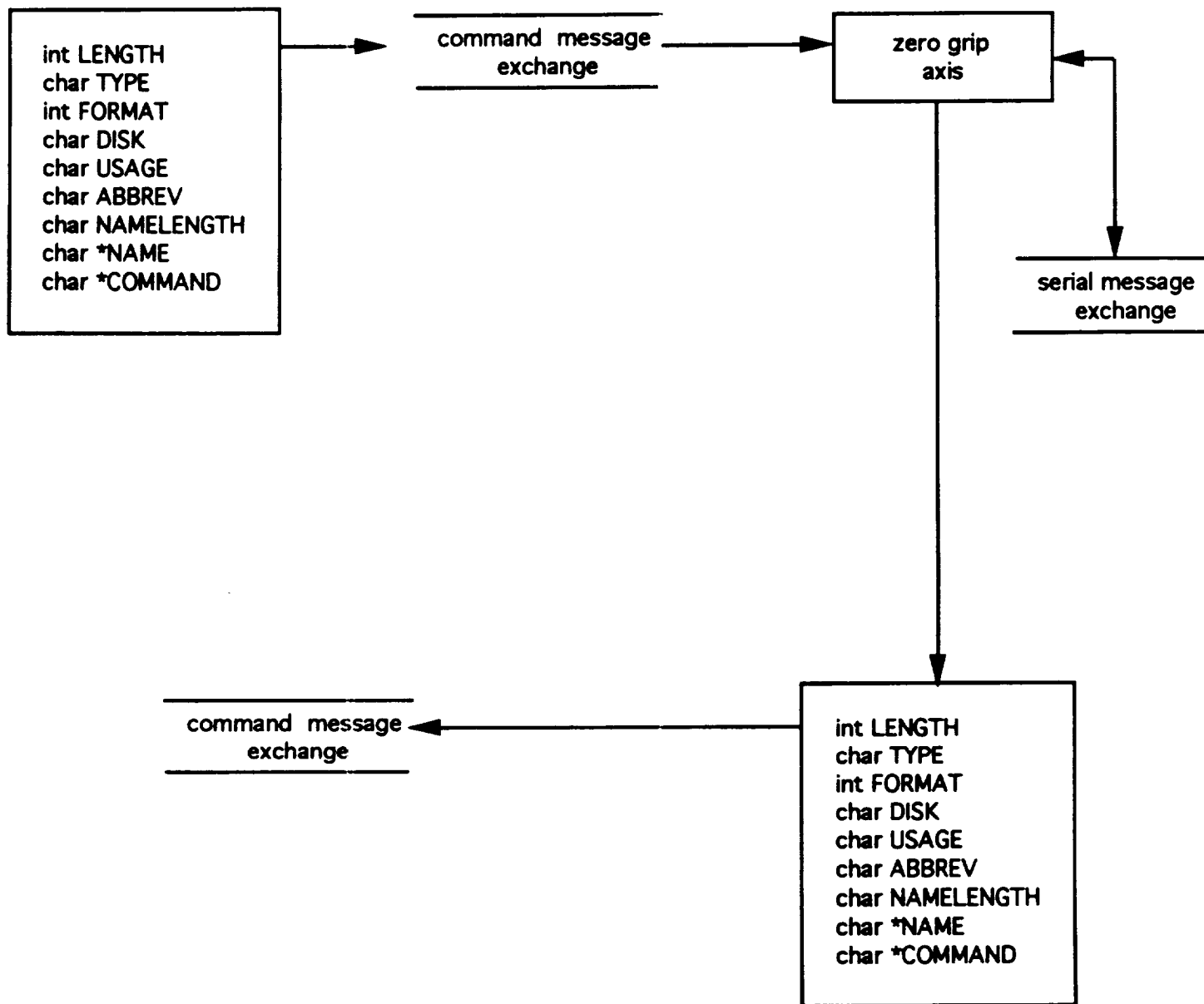
ZERO RADIAL AXIS
COMMANDCODE #59



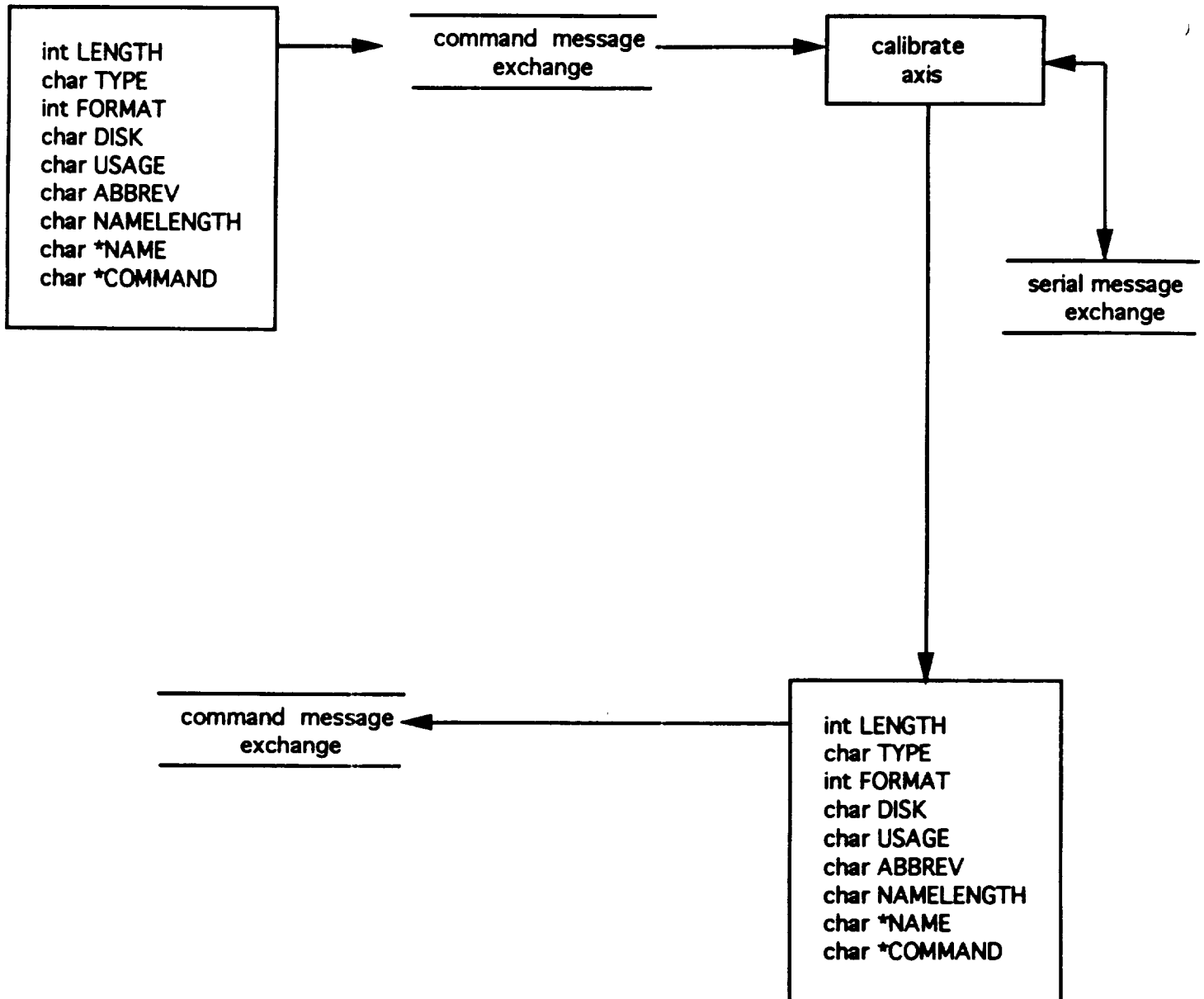
ZERO AZIMUTH AXIS
COMMANDCODE #60



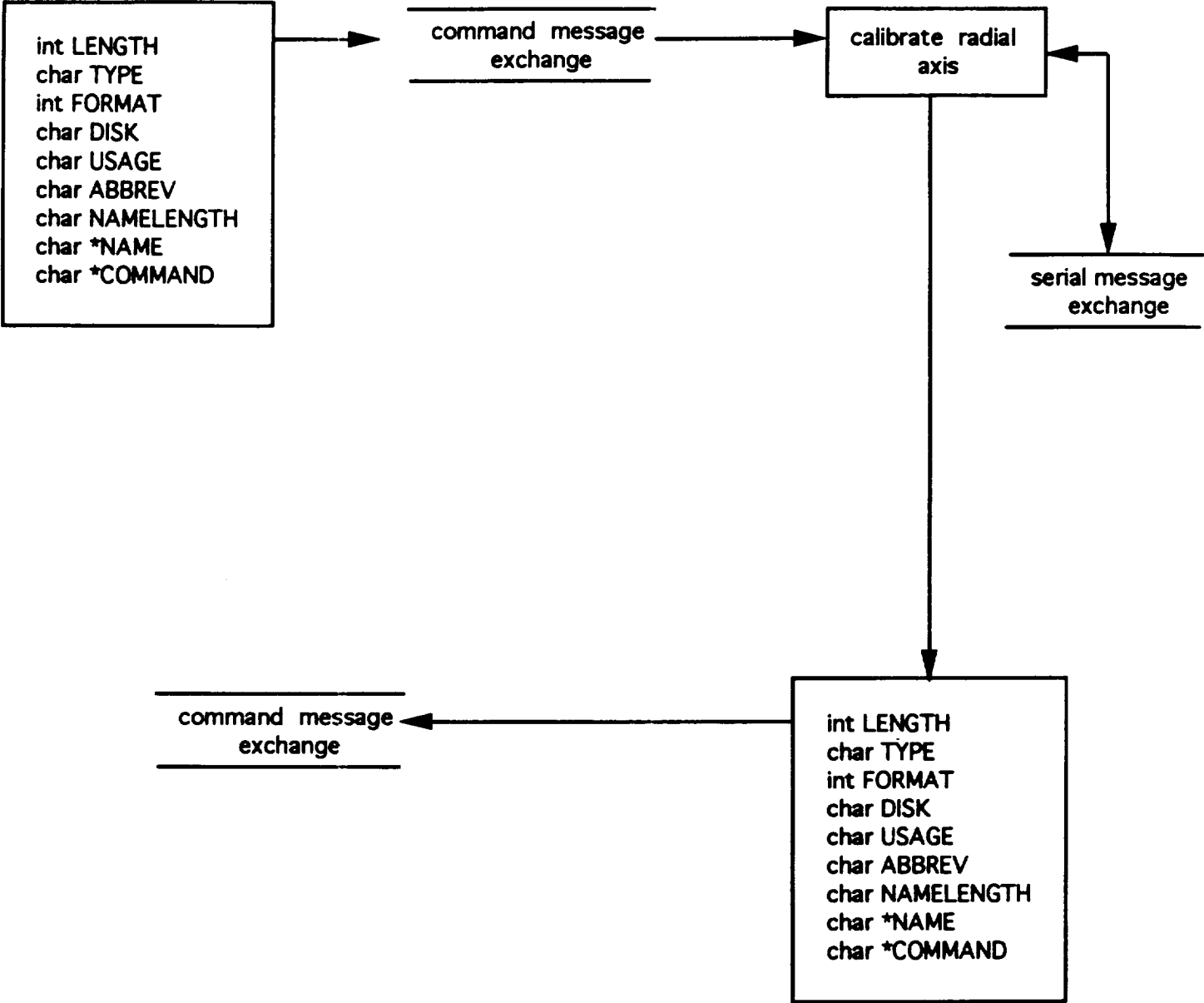
**ZERO GRIP AXIS
COMMANDCODE #61**



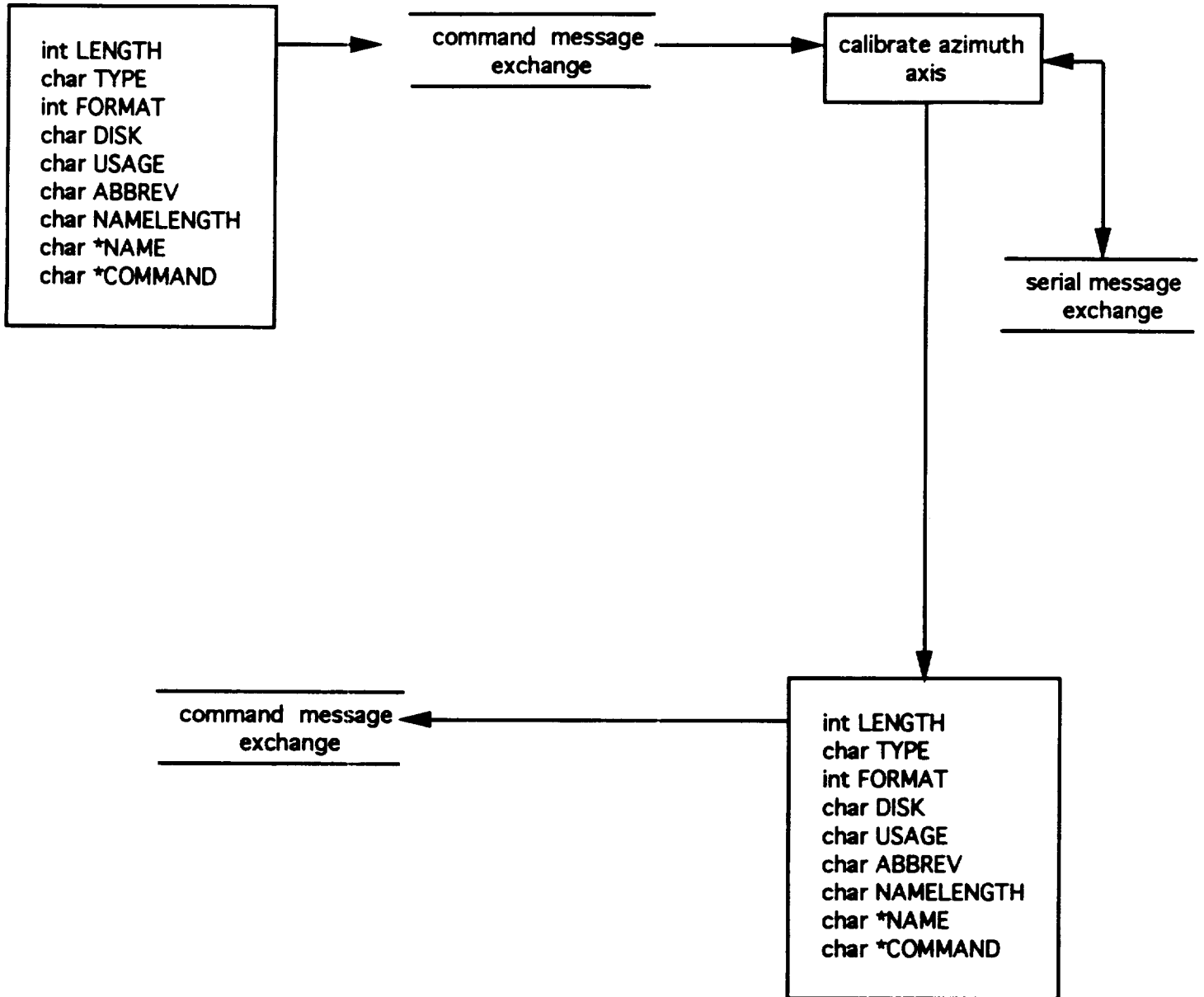
**CALIBRATE ELEVATION AXIS
COMMANDCODE #62**



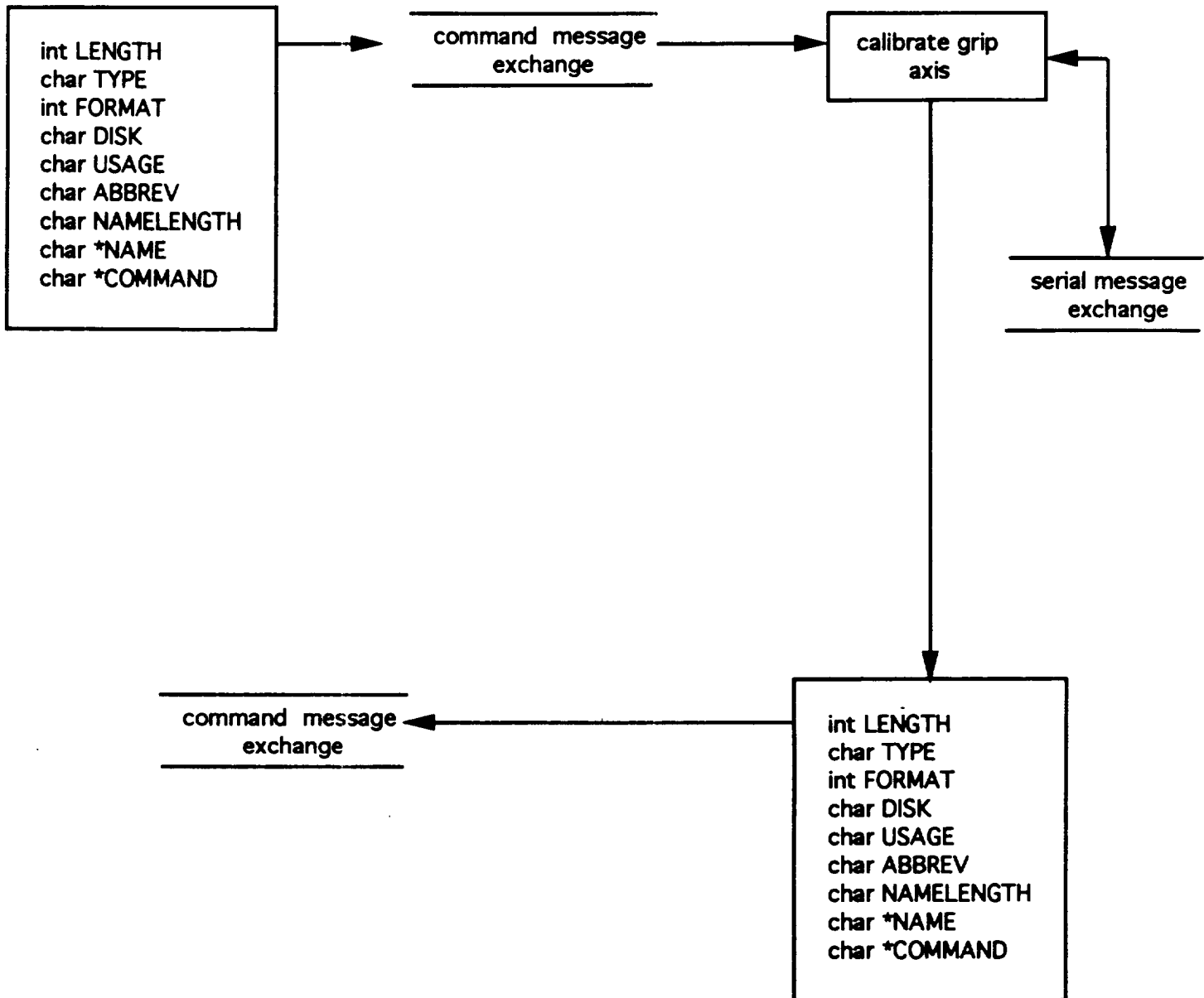
CALIBRATE RADIAL AXIS
COMMANDCODE #63



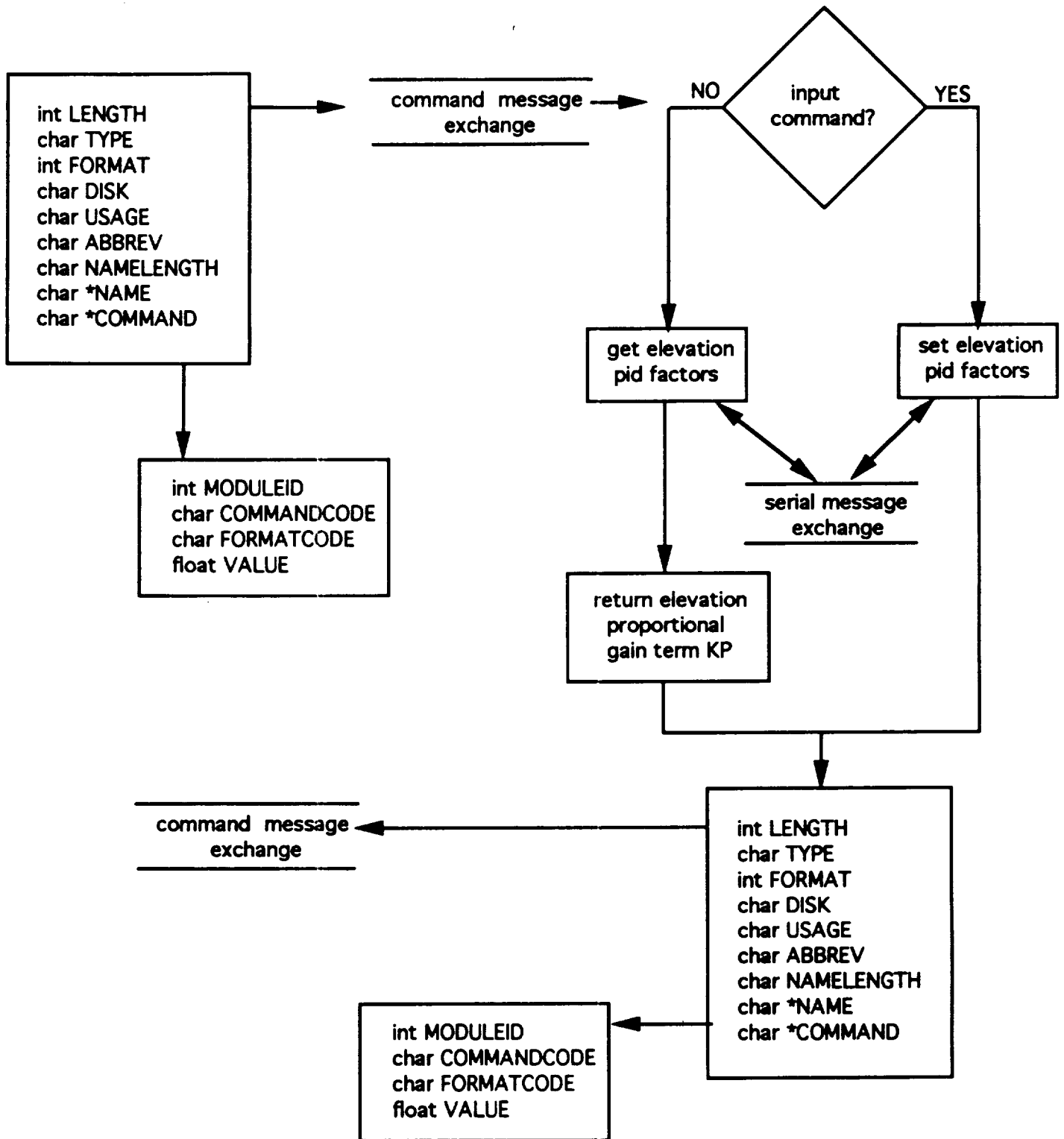
CALIBRATE AZIMUTH AXIS COMMANDCODE #64



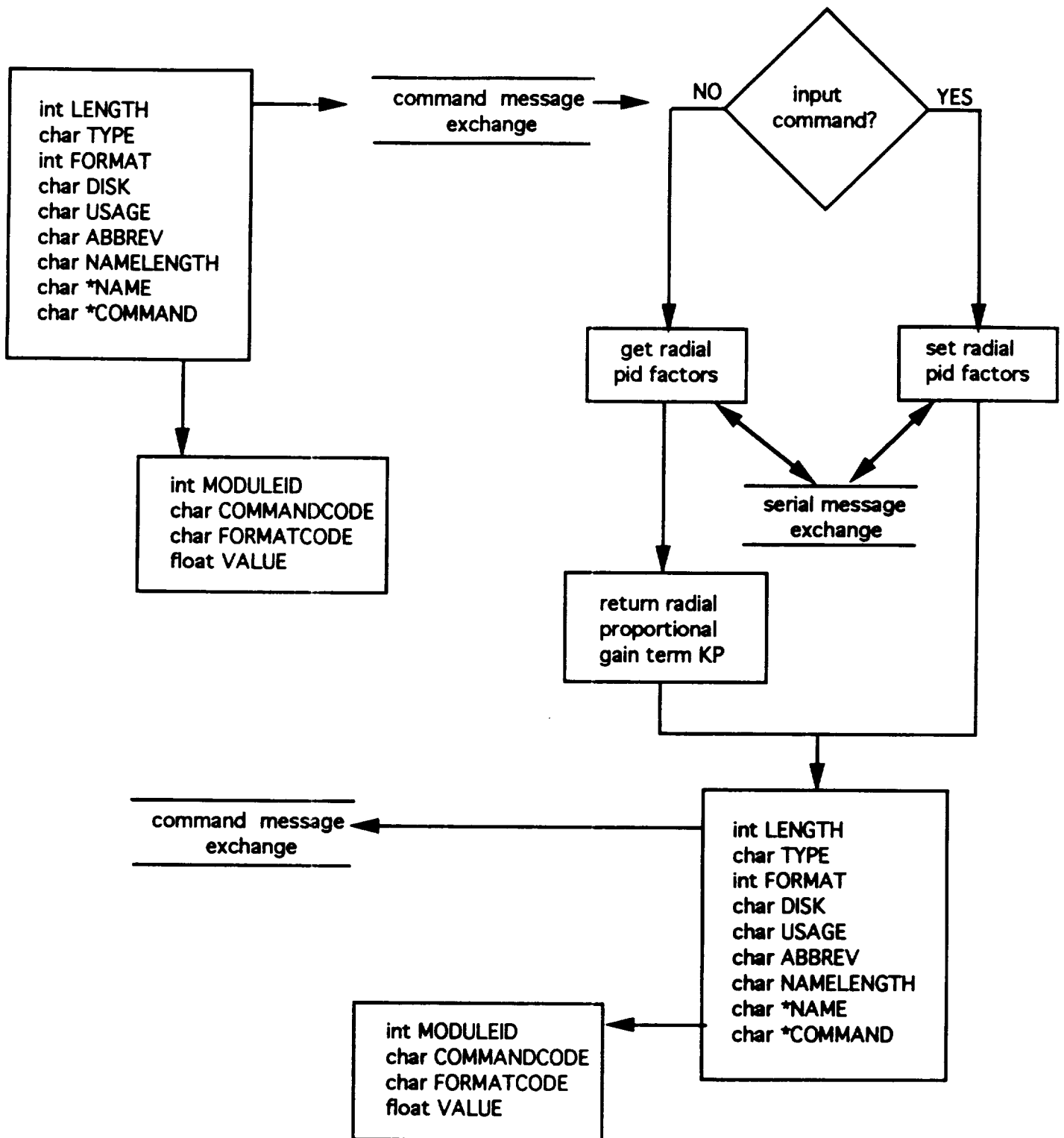
**CALIBRATE GRIP AXIS
COMMANDCODE #65**



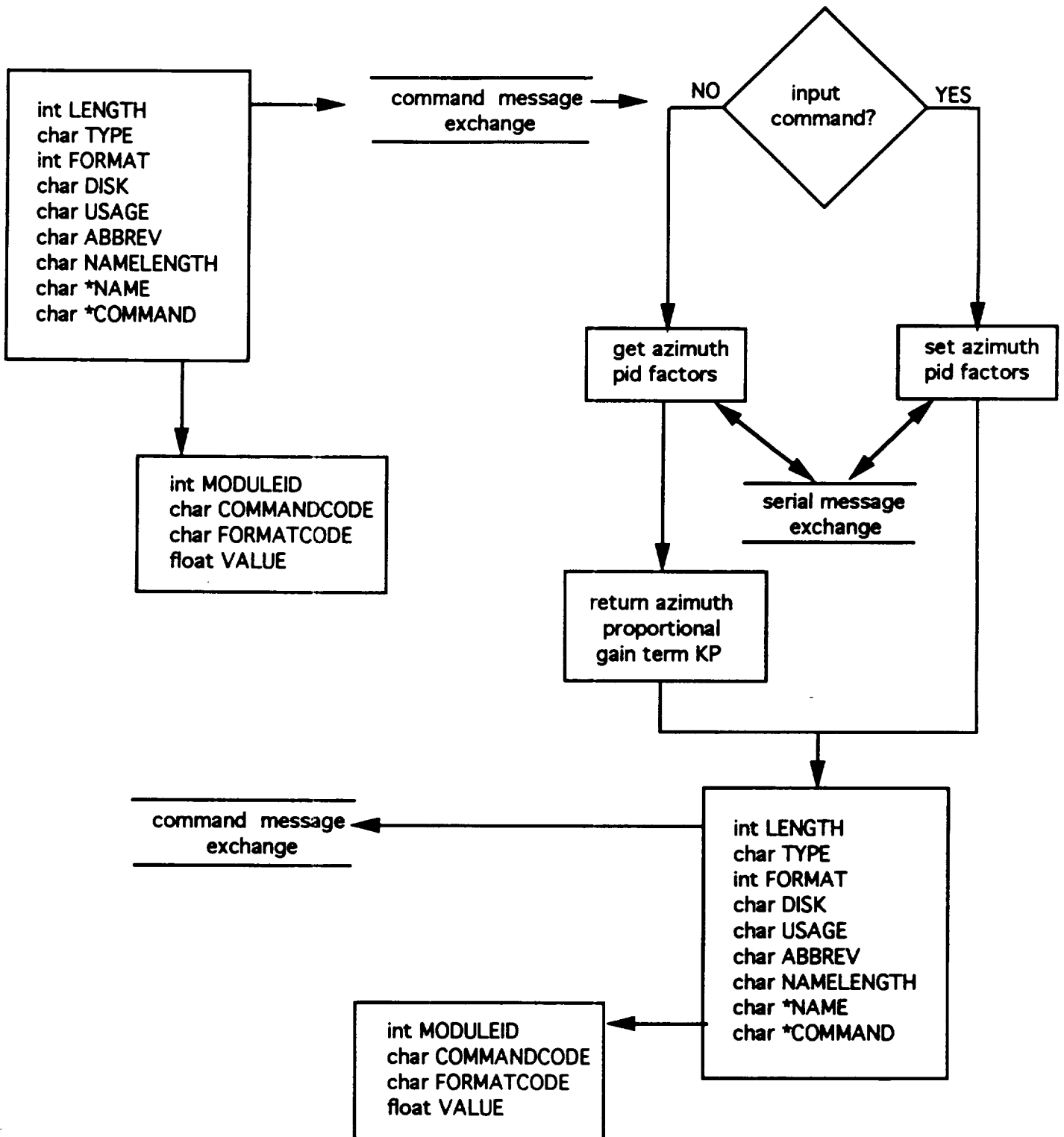
ELEVATION PROPORTIONAL GAIN COMMAND
COMMANDCODE #66



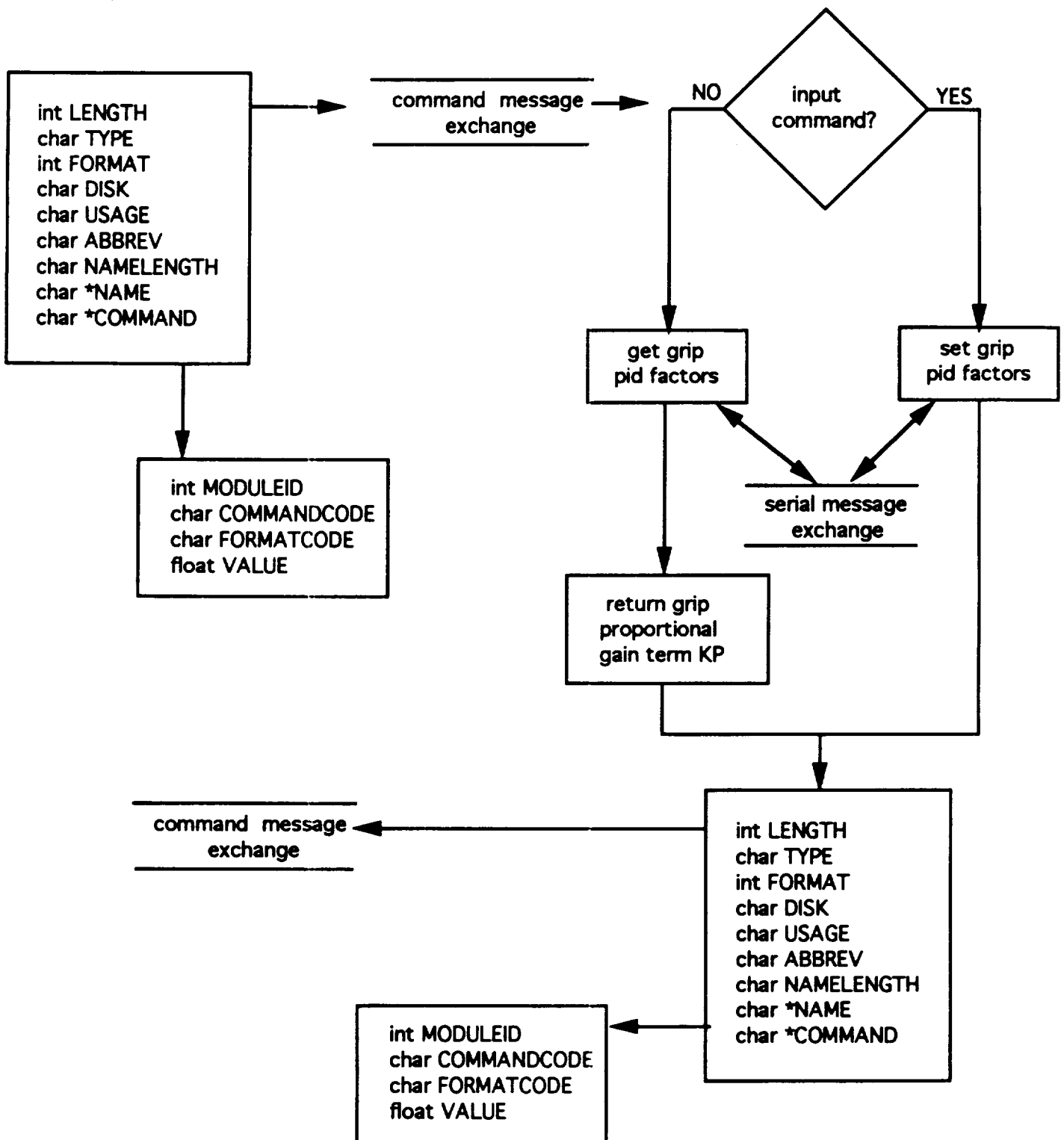
**RADIAL PROPORTIONAL GAIN COMMAND
COMMANDCODE #67**



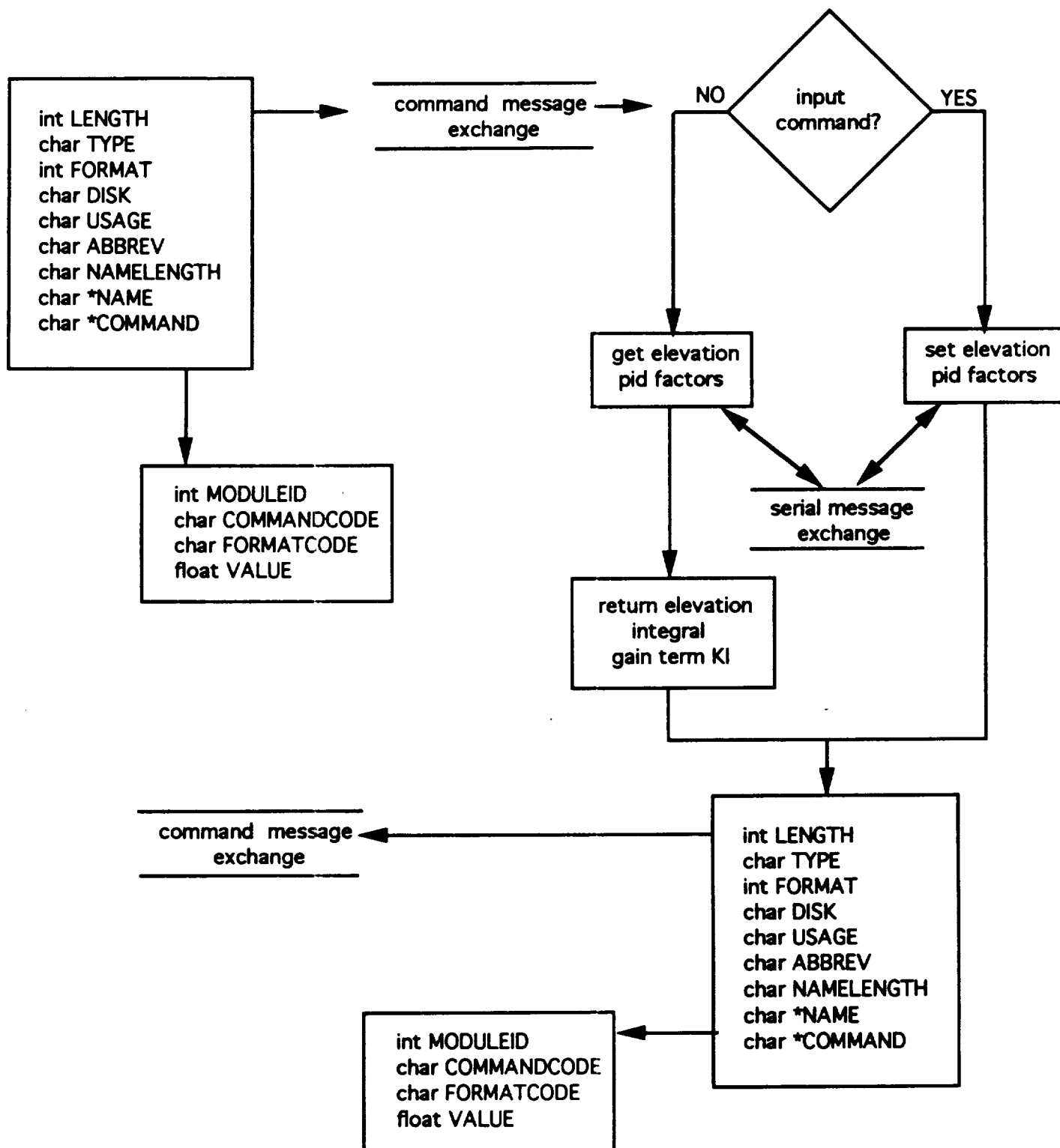
AZIMUTH PROPORTIONAL GAIN COMMAND
COMMANDCODE #68



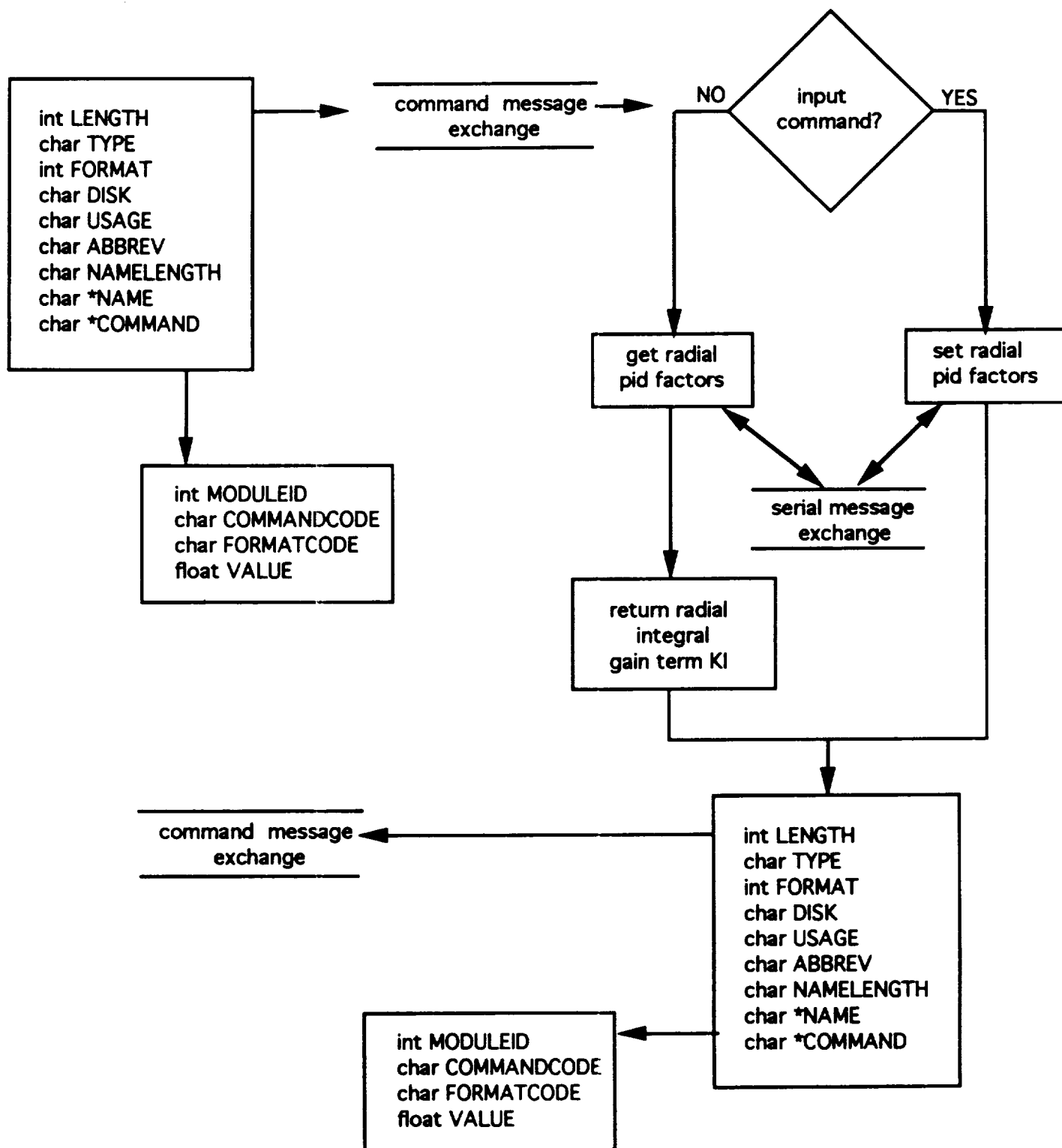
GRIP PROPORTIONAL GAIN COMMAND
COMMANDCODE #69



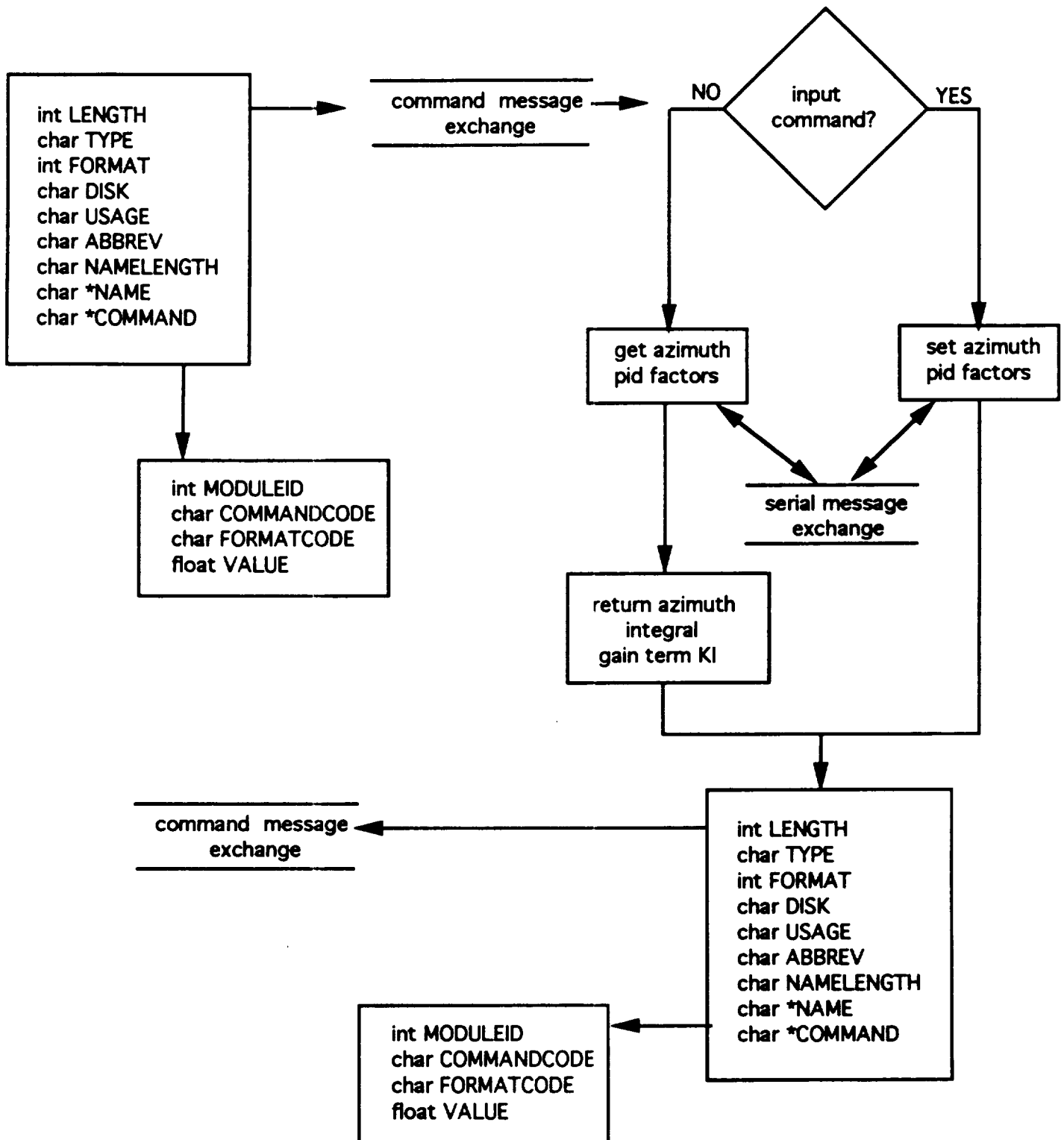
ELEVATION INTEGRAL GAIN COMMAND
COMMANDCODE #70



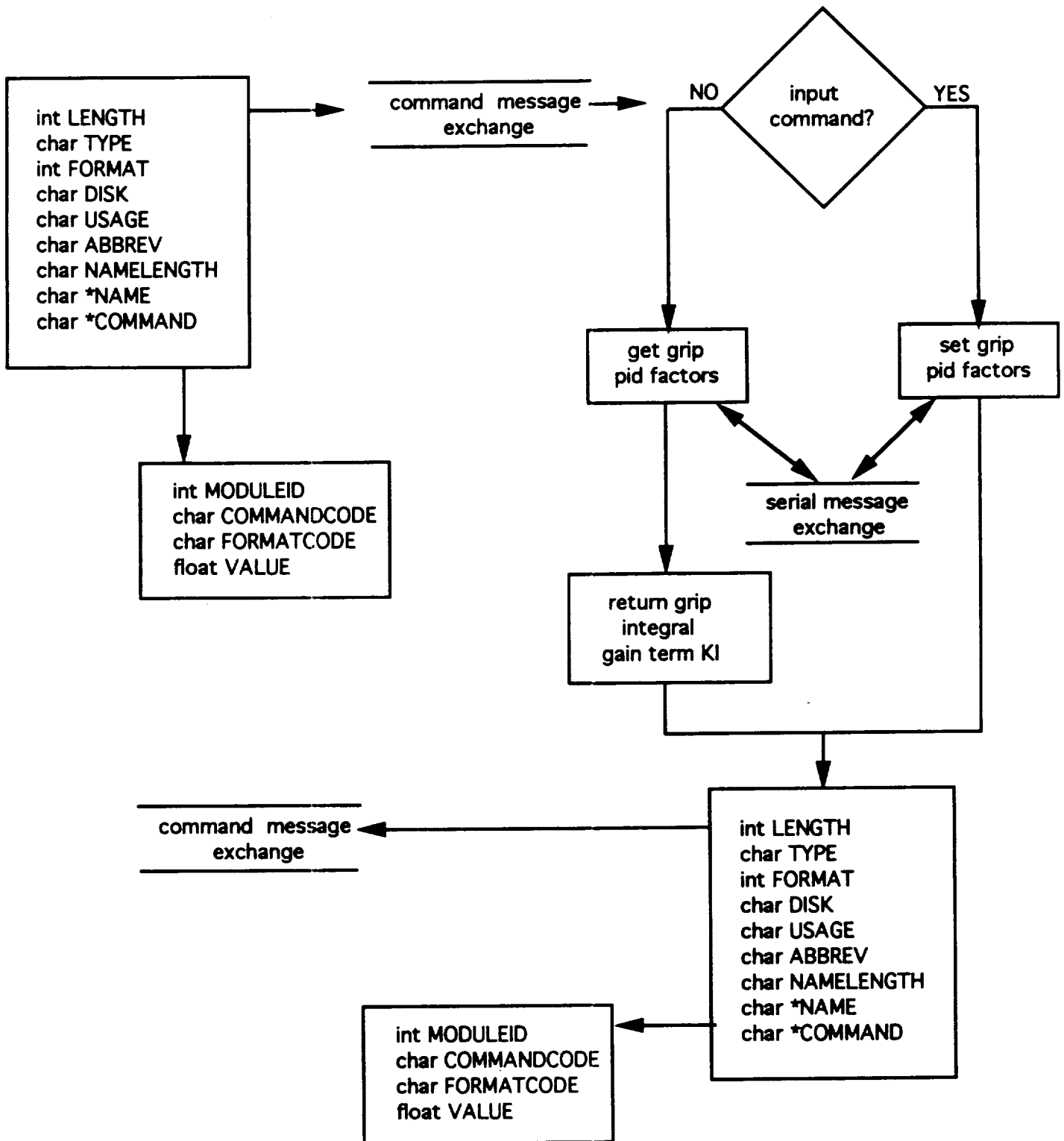
RADIAL INTEGRAL GAIN COMMAND COMMANDCODE #71



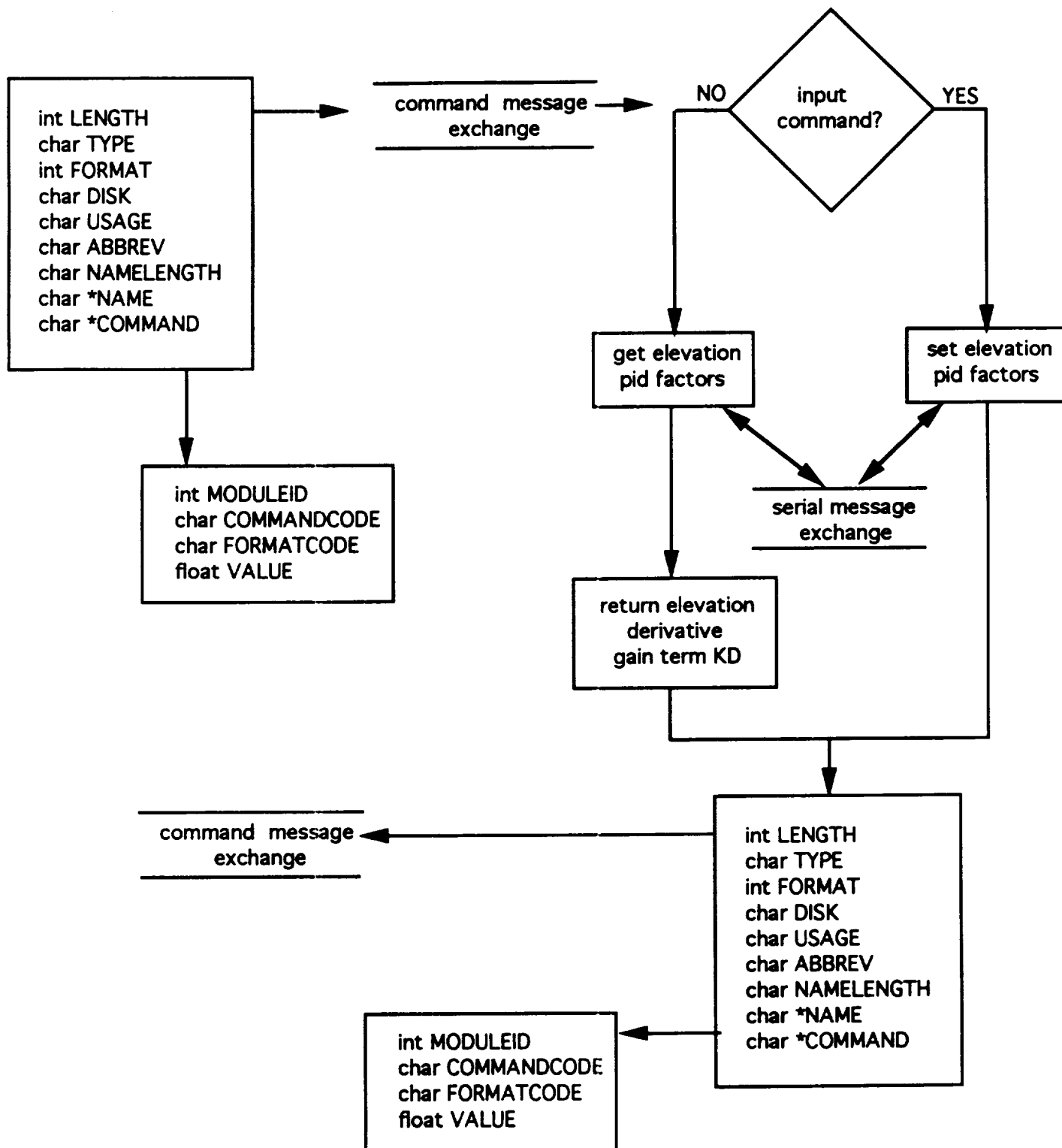
**AZIMUTH INTEGRAL GAIN COMMAND
COMMANDCODE #72**



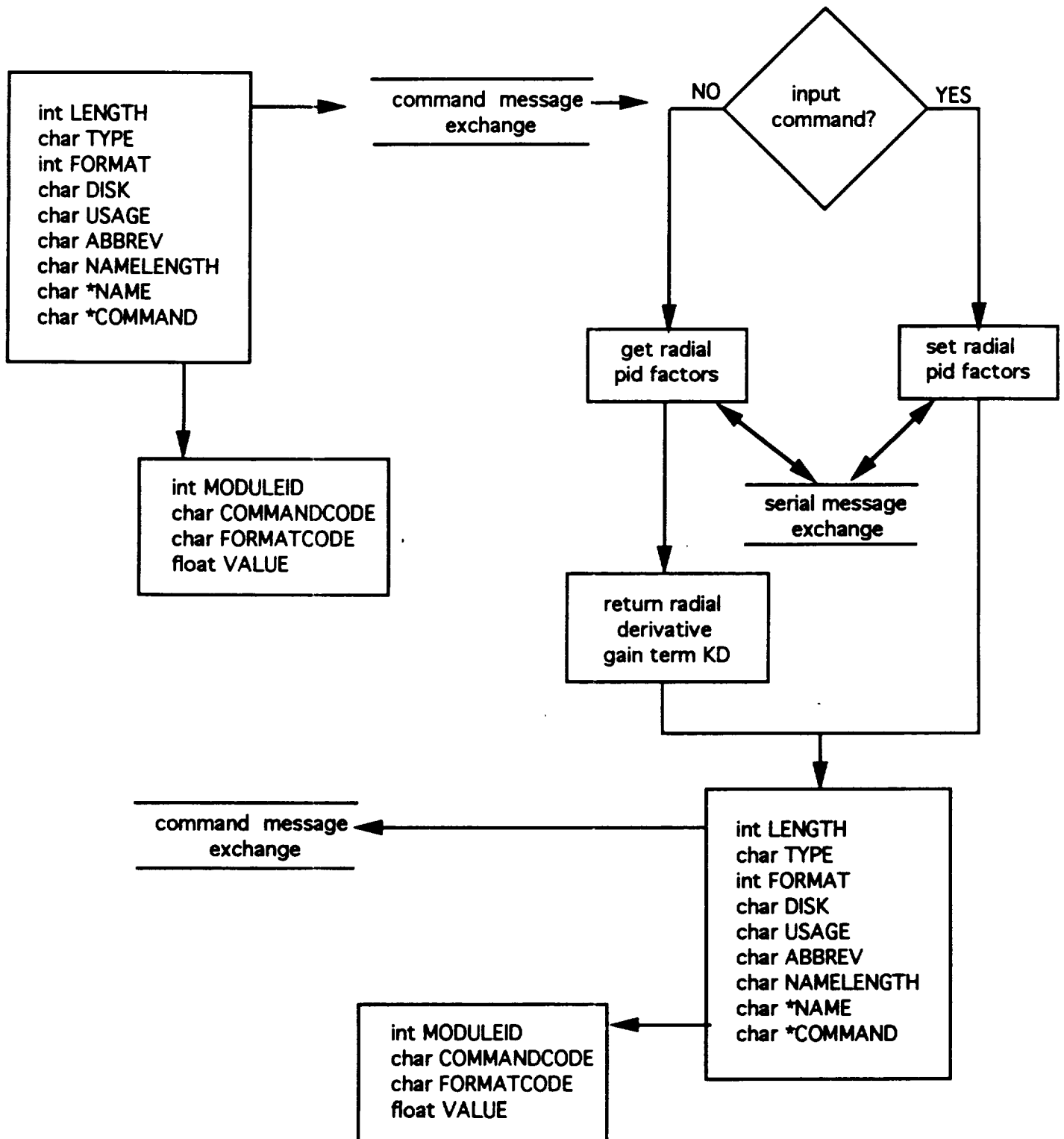
GRIP INTEGRAL GAIN COMMAND
COMMANDCODE #73



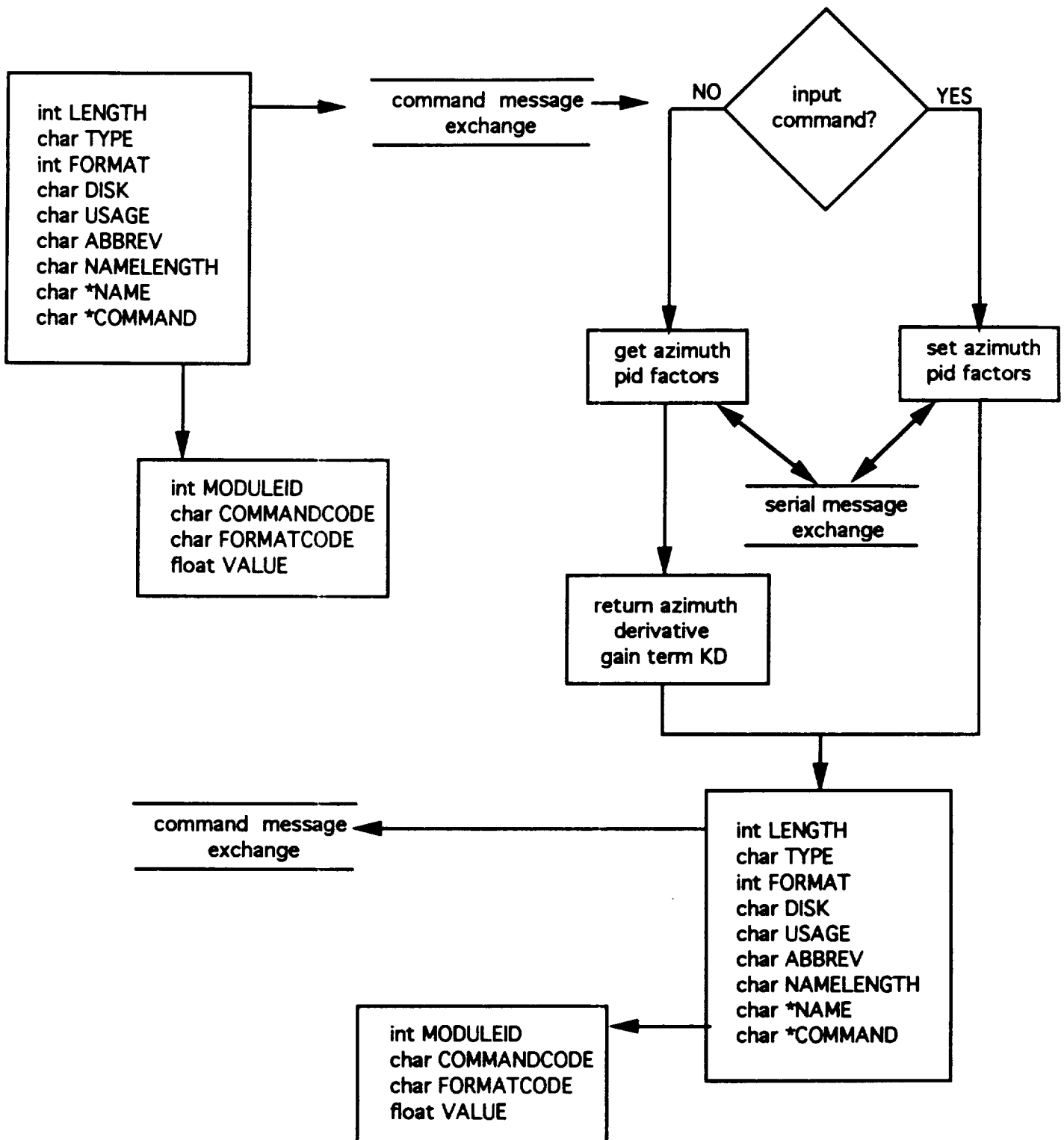
ELEVATION DERIVATIVE GAIN COMMAND
COMMANDCODE #74



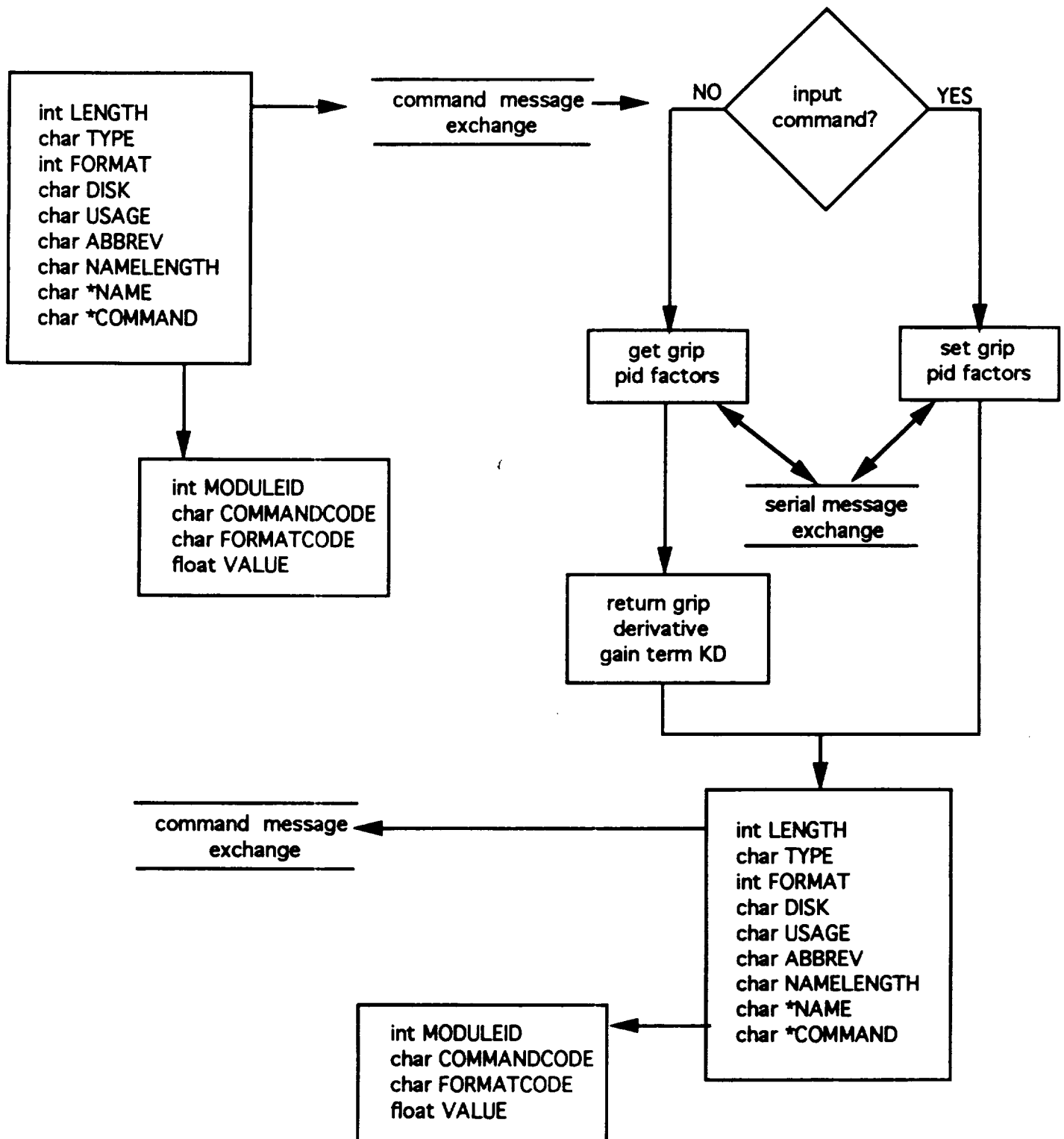
**RADIAL DERIVATIVE GAIN COMMAND
COMMANDCODE #75**



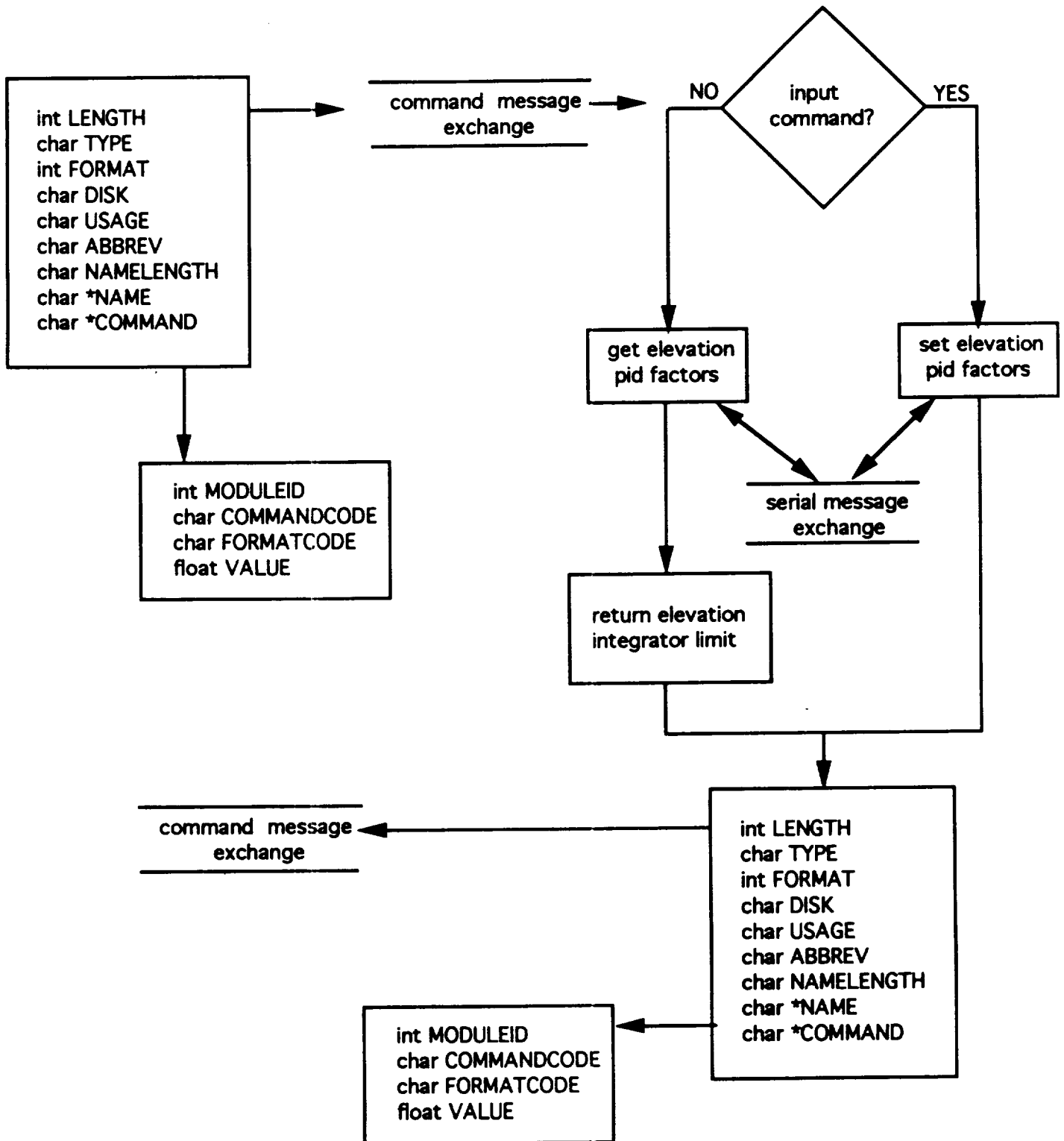
**AZIMUTH DERIVATIVE GAIN COMMAND
COMMANDCODE #76**



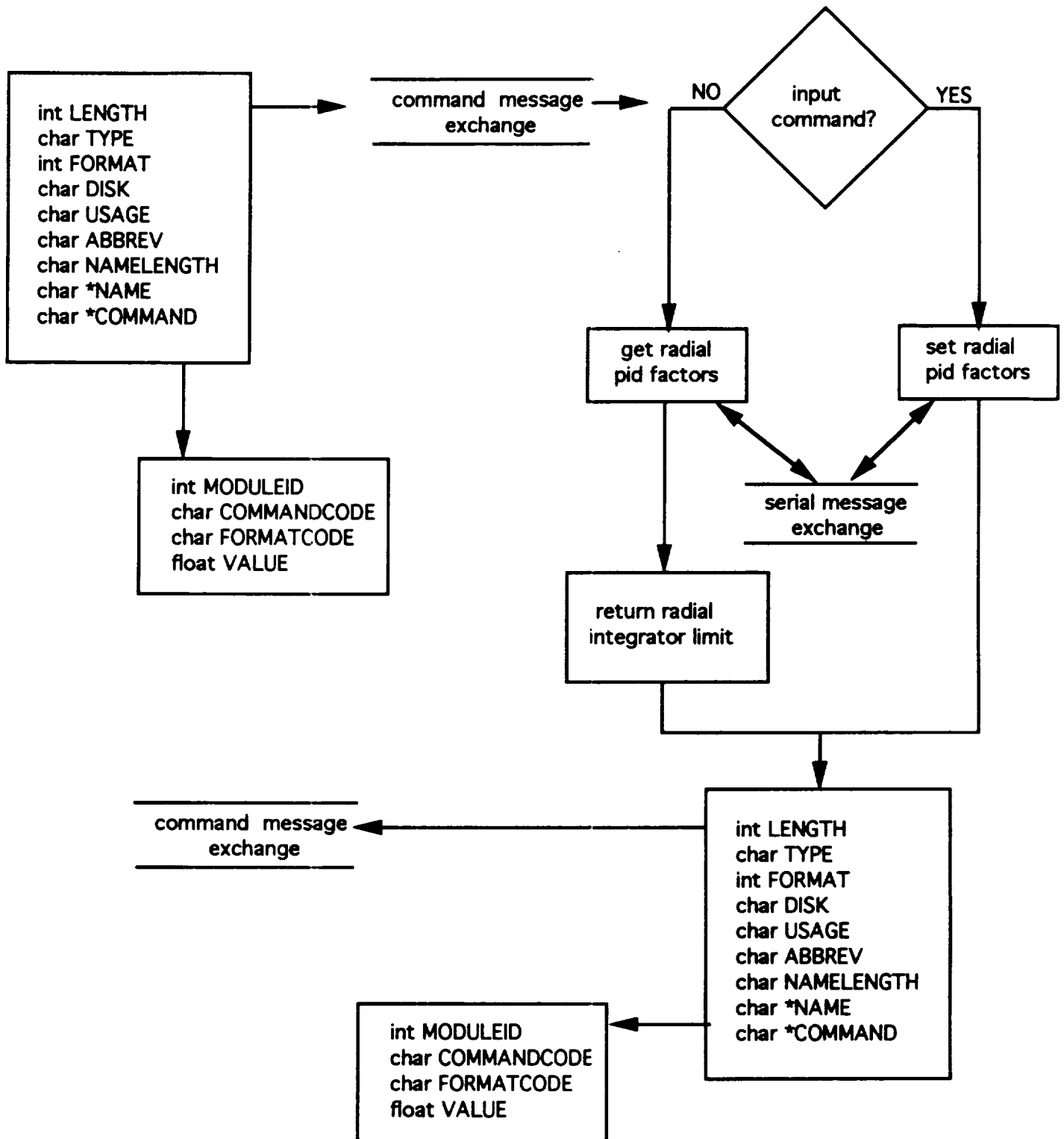
**GRIP DERIVATIVE GAIN COMMAND
COMMANDCODE #77**



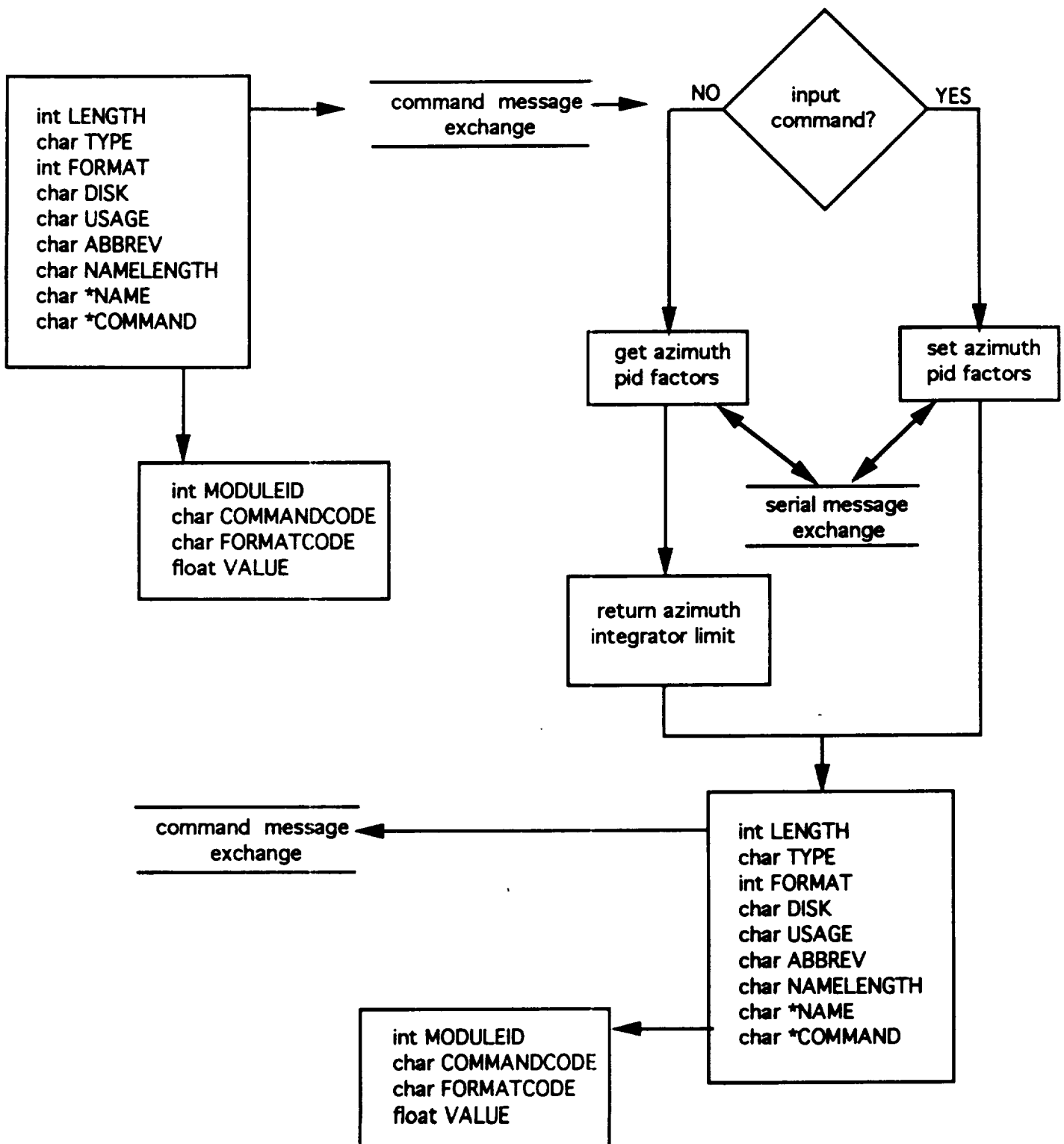
ELEVATION INTEGRATOR LIMIT COMMAND
COMMANDCODE #78



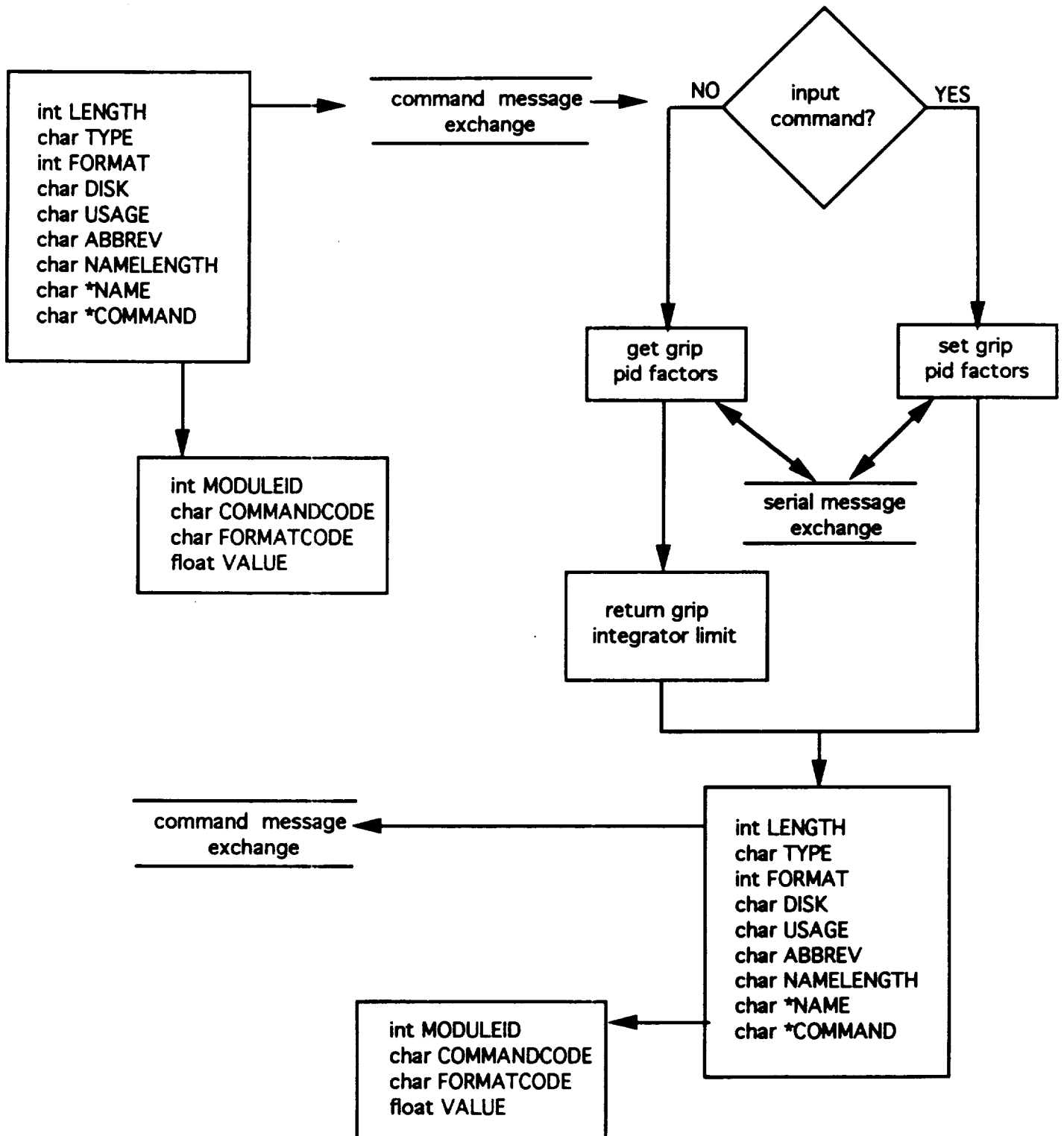
RADIAL INTEGRATOR LIMIT COMMAND
COMMANDCODE #79



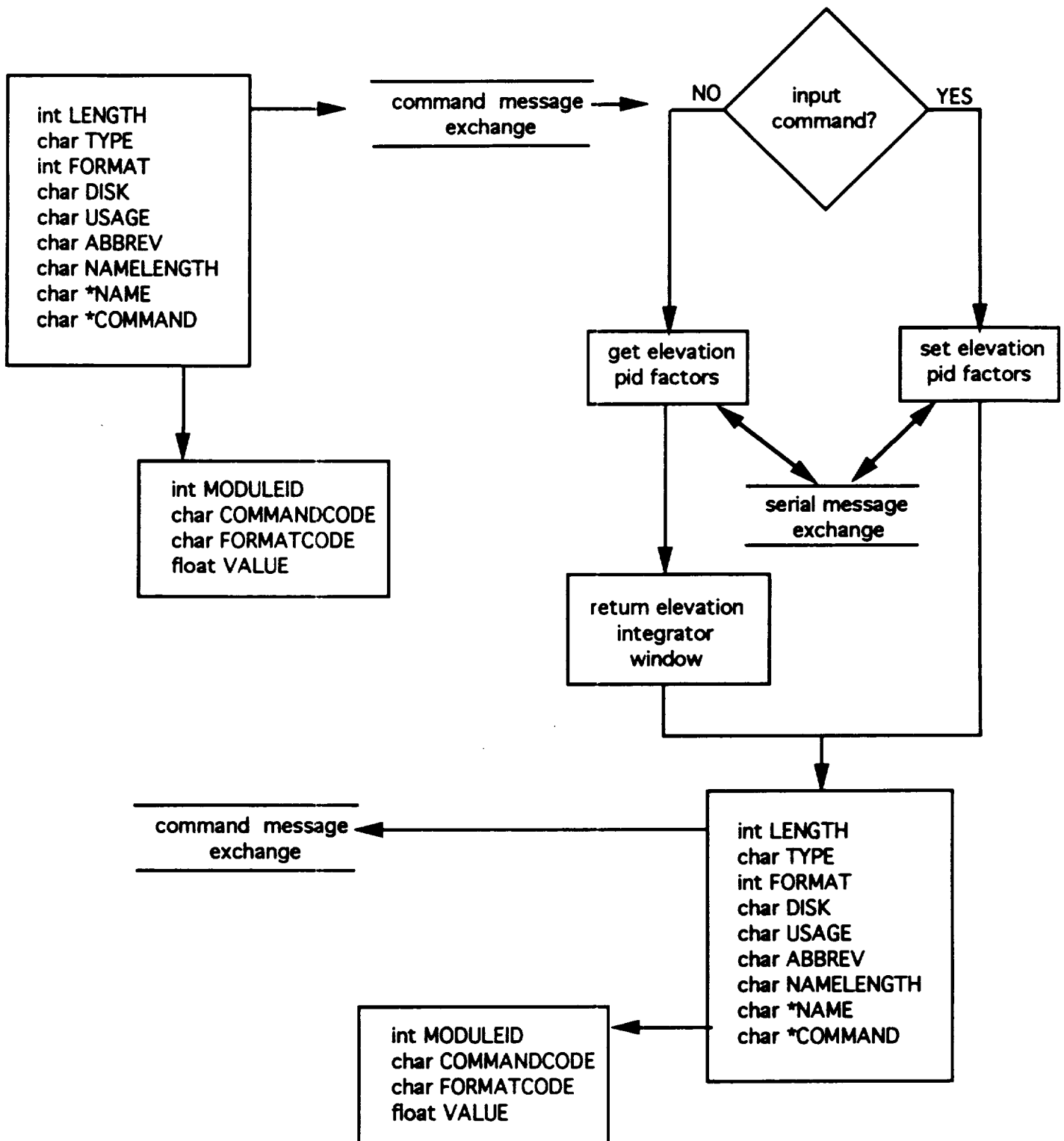
AZIMUTH INTEGRATOR LIMIT COMMAND COMMANDCODE #80



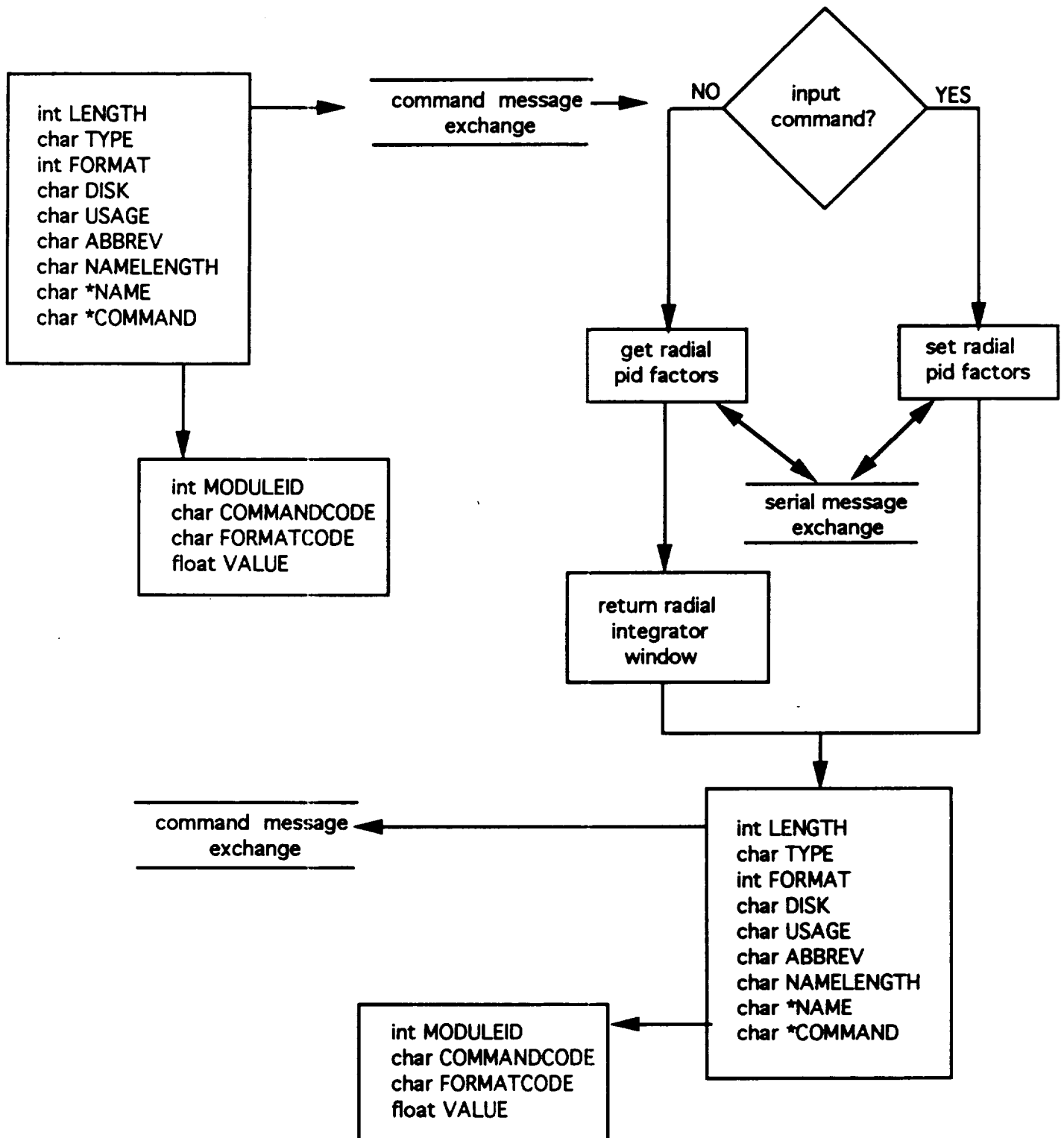
GRIP INTEGRATOR LIMIT COMMAND
COMMANDCODE #81



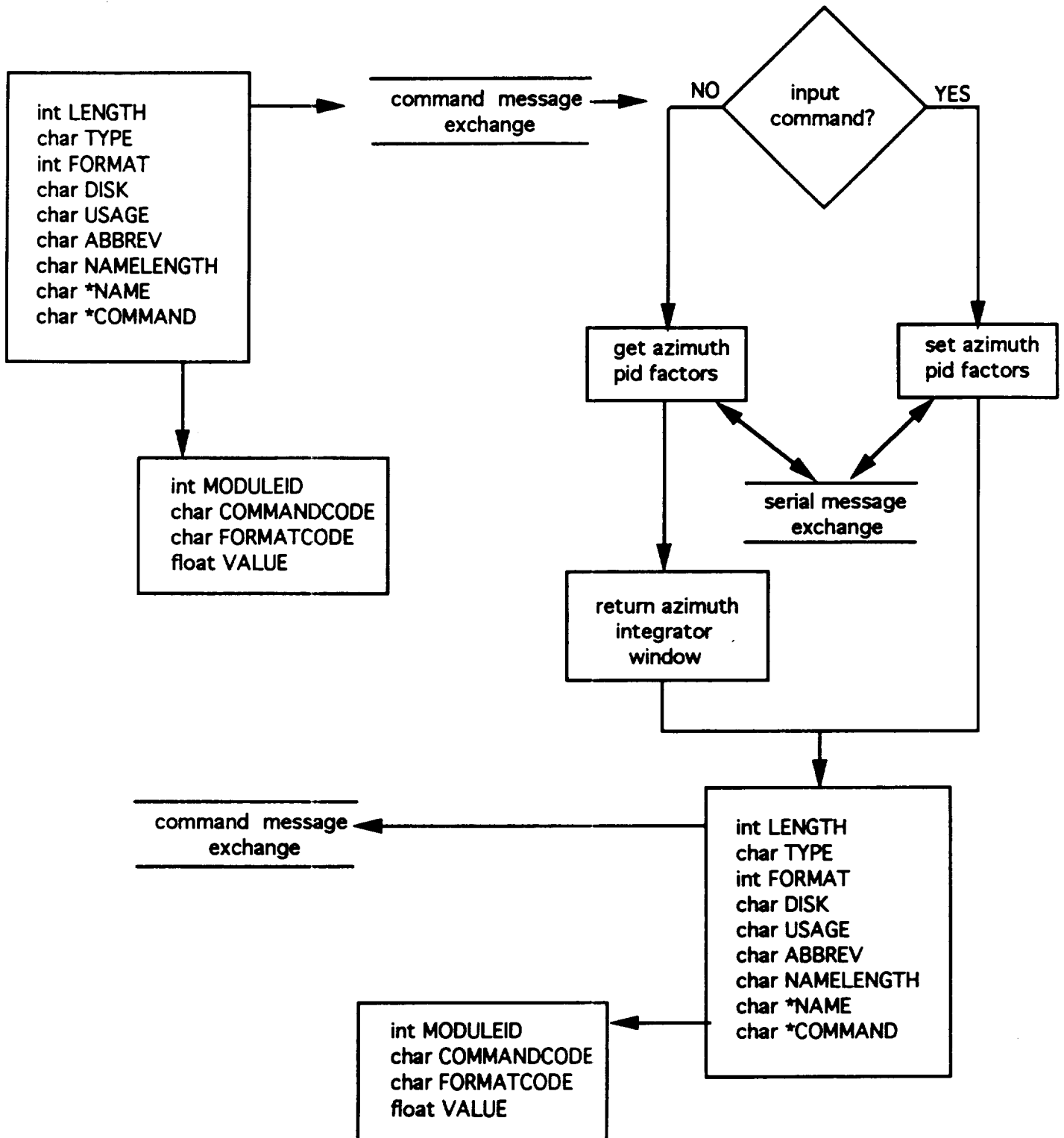
ELEVATION INTEGRATOR WINDOW COMMAND COMMANDCODE #82



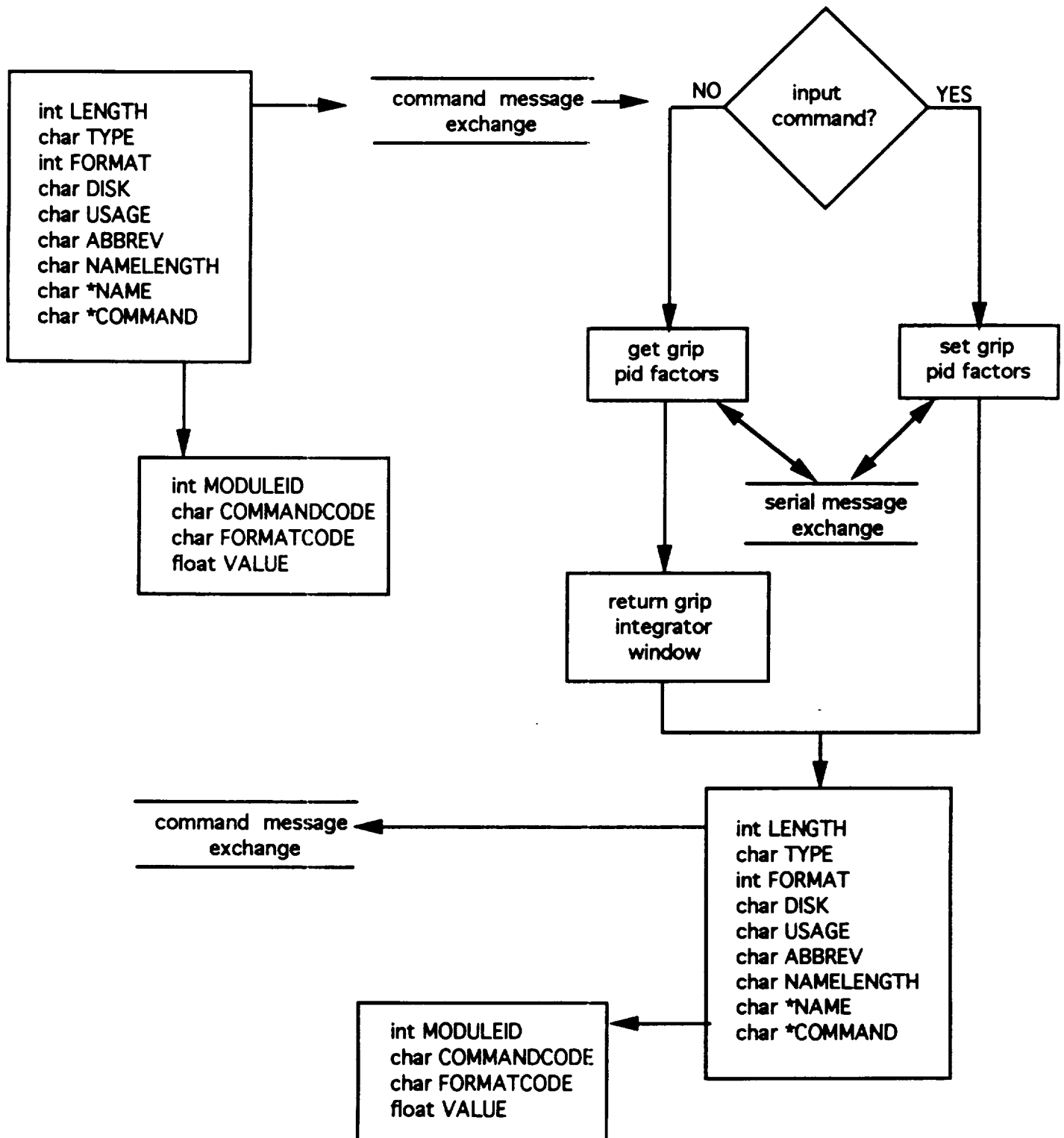
**RADIAL INTEGRATOR WINDOW COMMAND
COMMANDCODE #83**



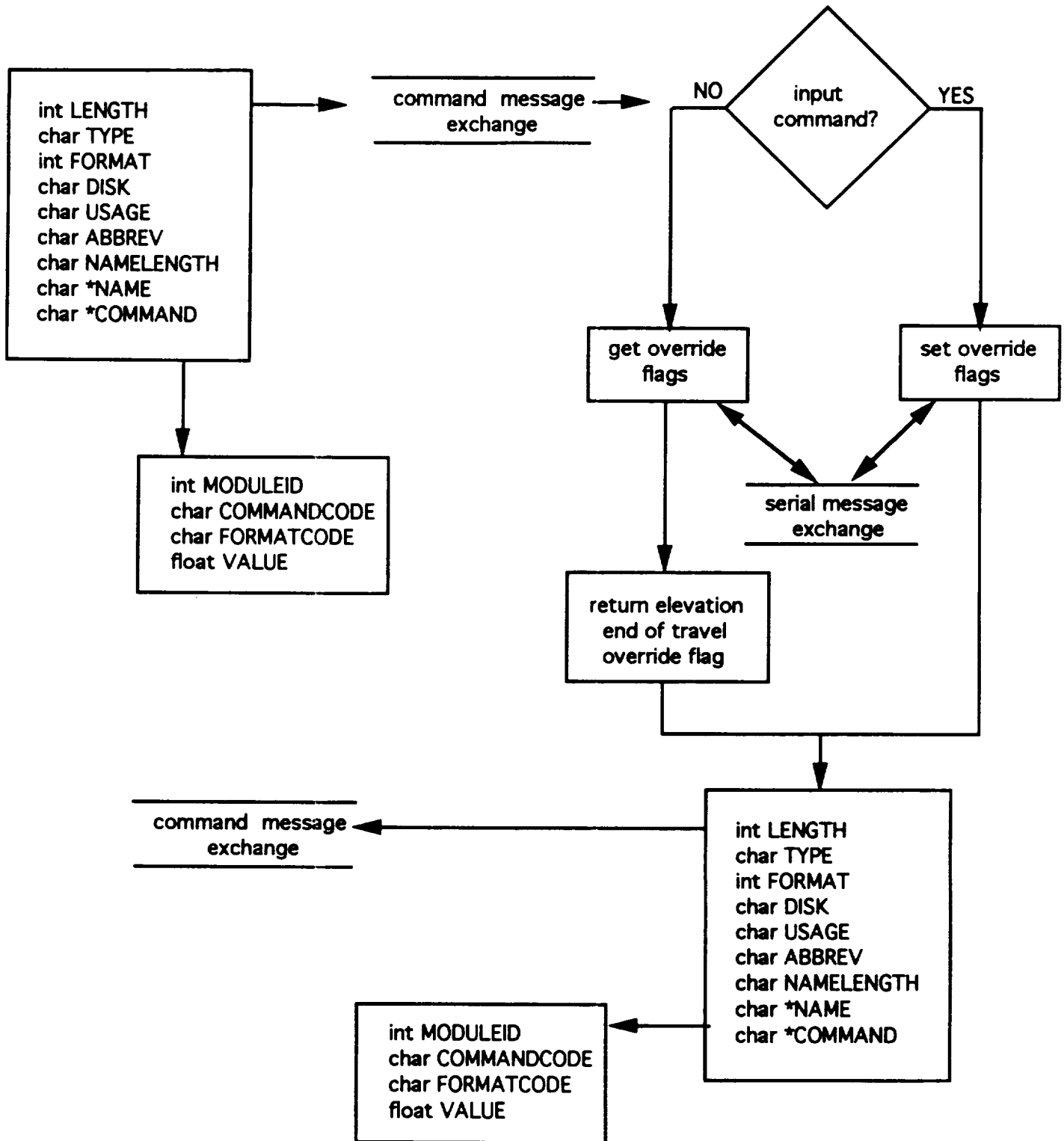
**AZIMUTH INTEGRATOR WINDOW COMMAND
COMMANDCODE #84**



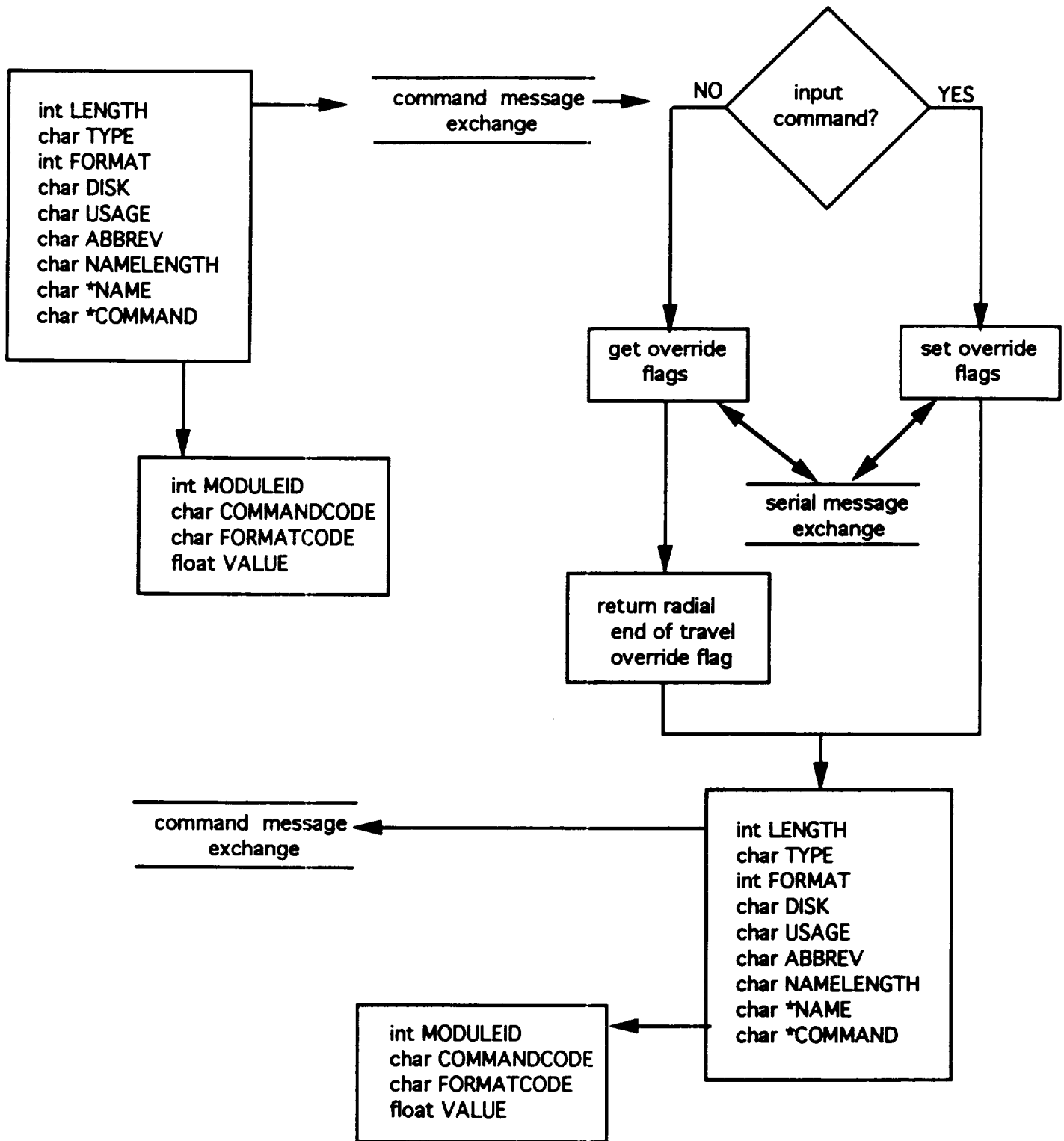
GRIP INTEGRATOR WINDOW COMMAND COMMANDCODE #85



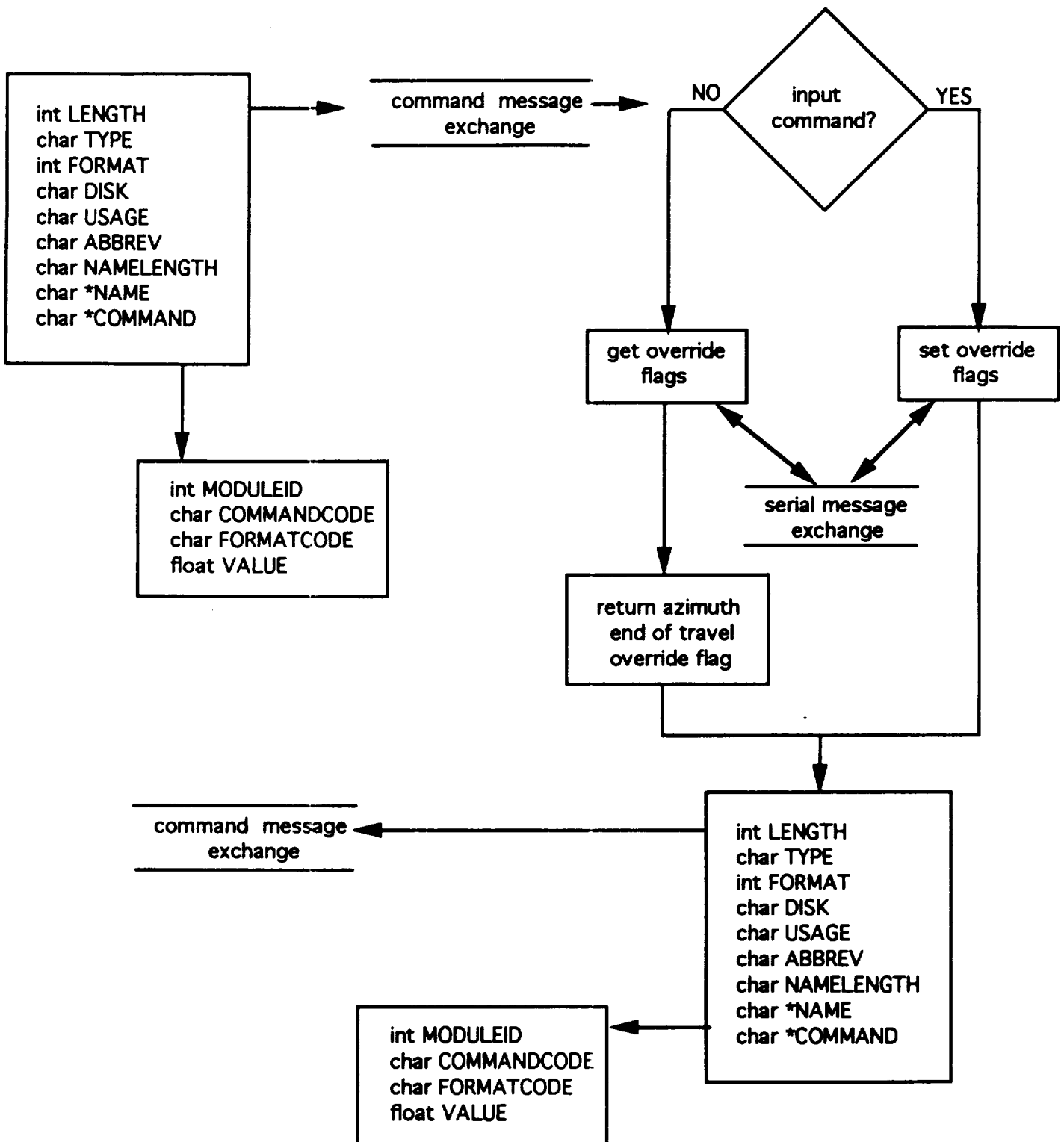
ELEVATION END OF TRAVEL OVERRIDE COMMAND
COMMANDCODE #86



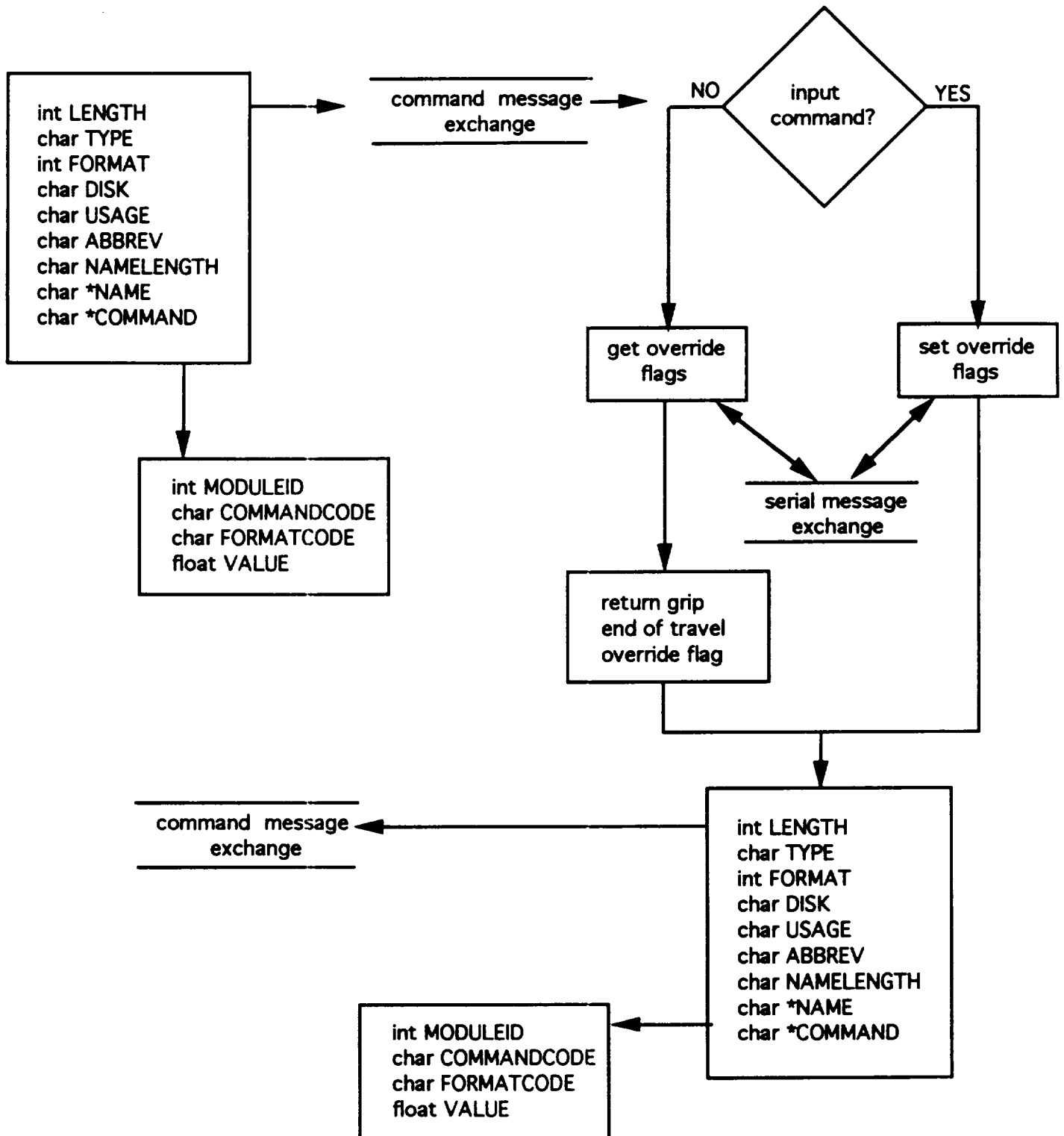
**RADIAL END OF TRAVEL OVERRIDE COMMAND
COMMANDCODE #87**



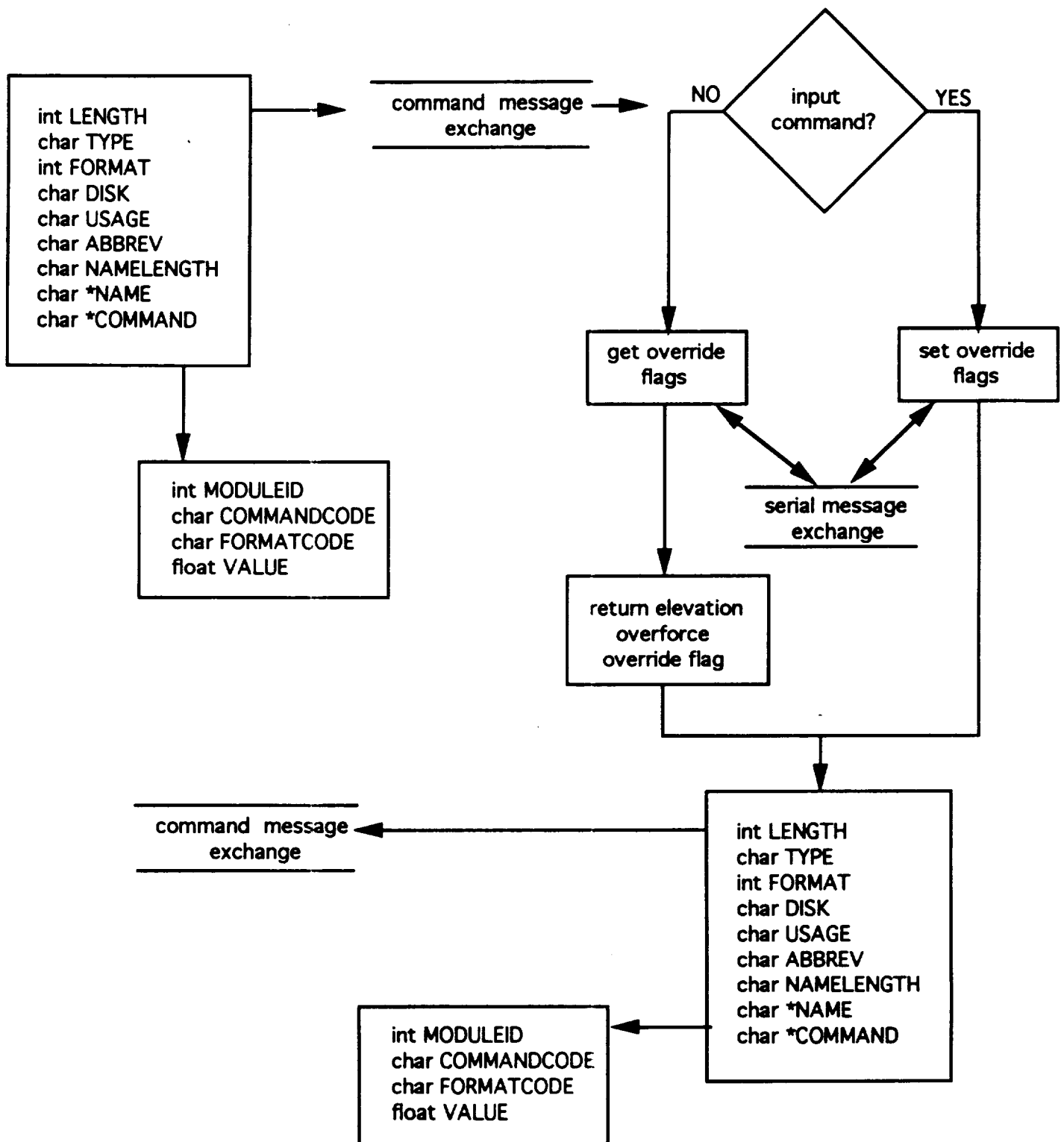
**AZIMUTH END OF TRAVEL OVERRIDE COMMAND
COMMANDCODE #88**



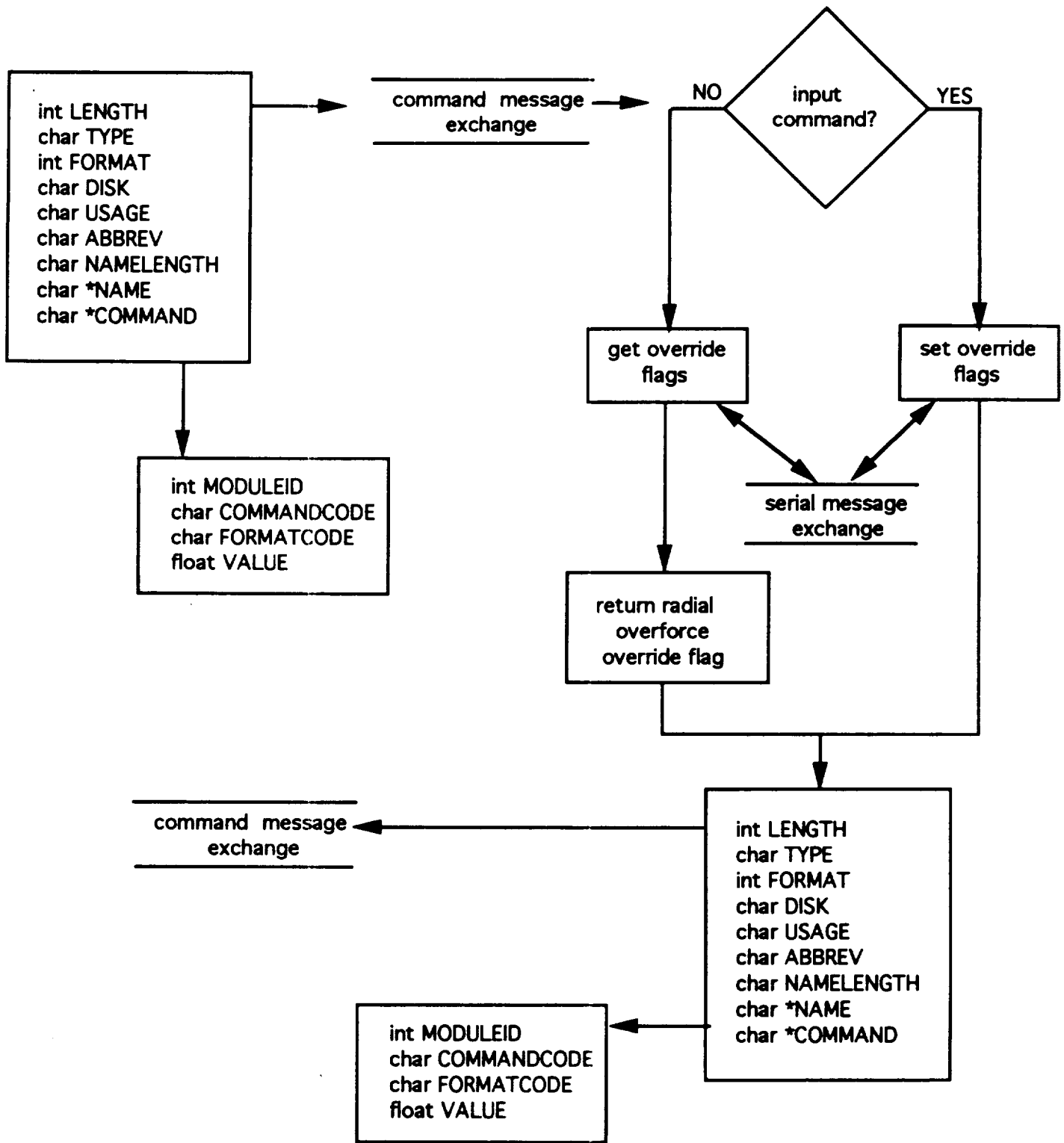
GRIP END OF TRAVEL OVERRIDE COMMAND COMMANDCODE #89



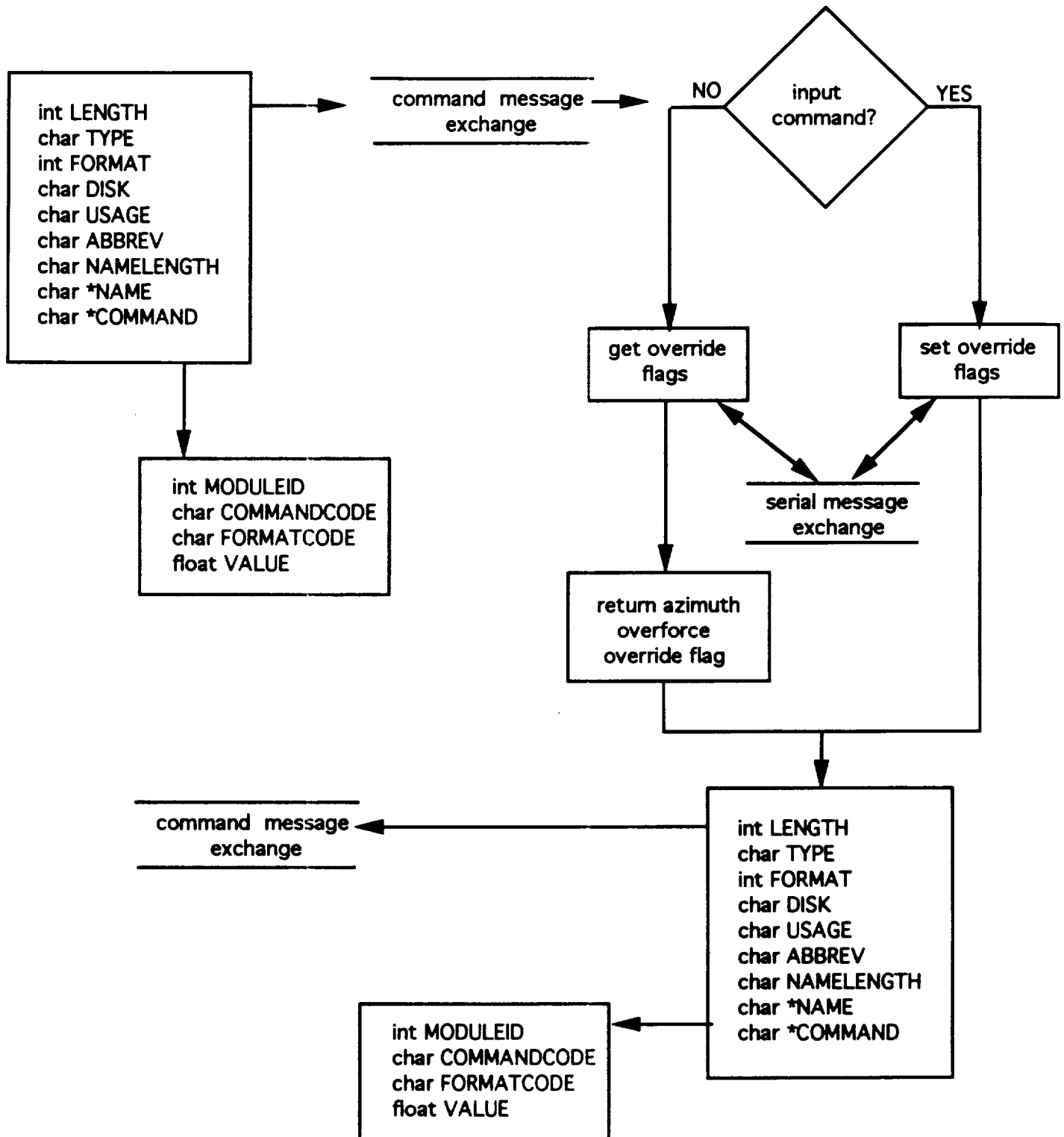
ELEVATION OVERFORCE OVERRIDE COMMAND COMMANDCODE #90



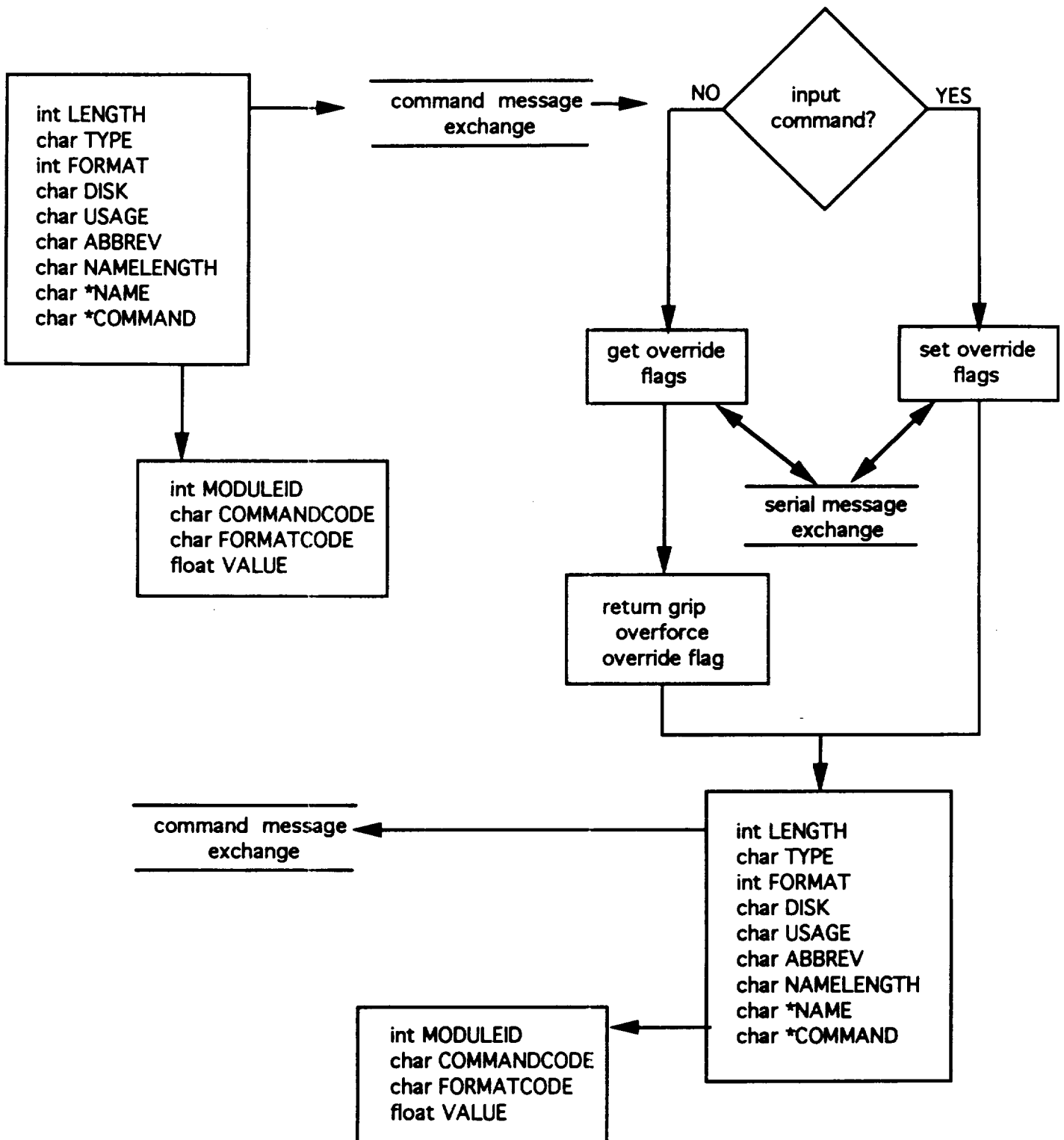
RADIAL OVERFORCE OVERRIDE COMMAND COMMANDCODE #91



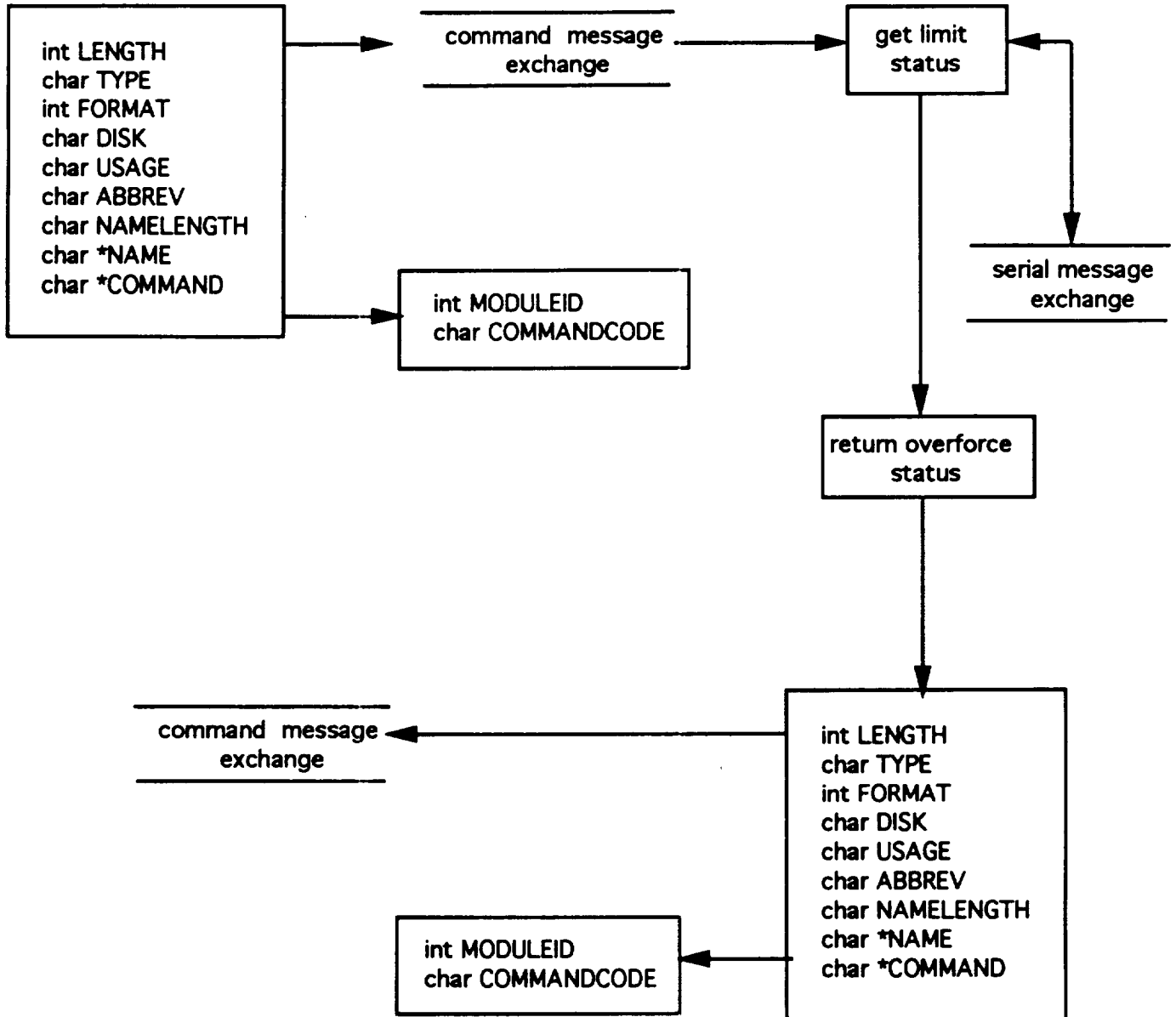
AZIMUTH OVERFORCE OVERRIDE COMMAND
COMMANDCODE #92



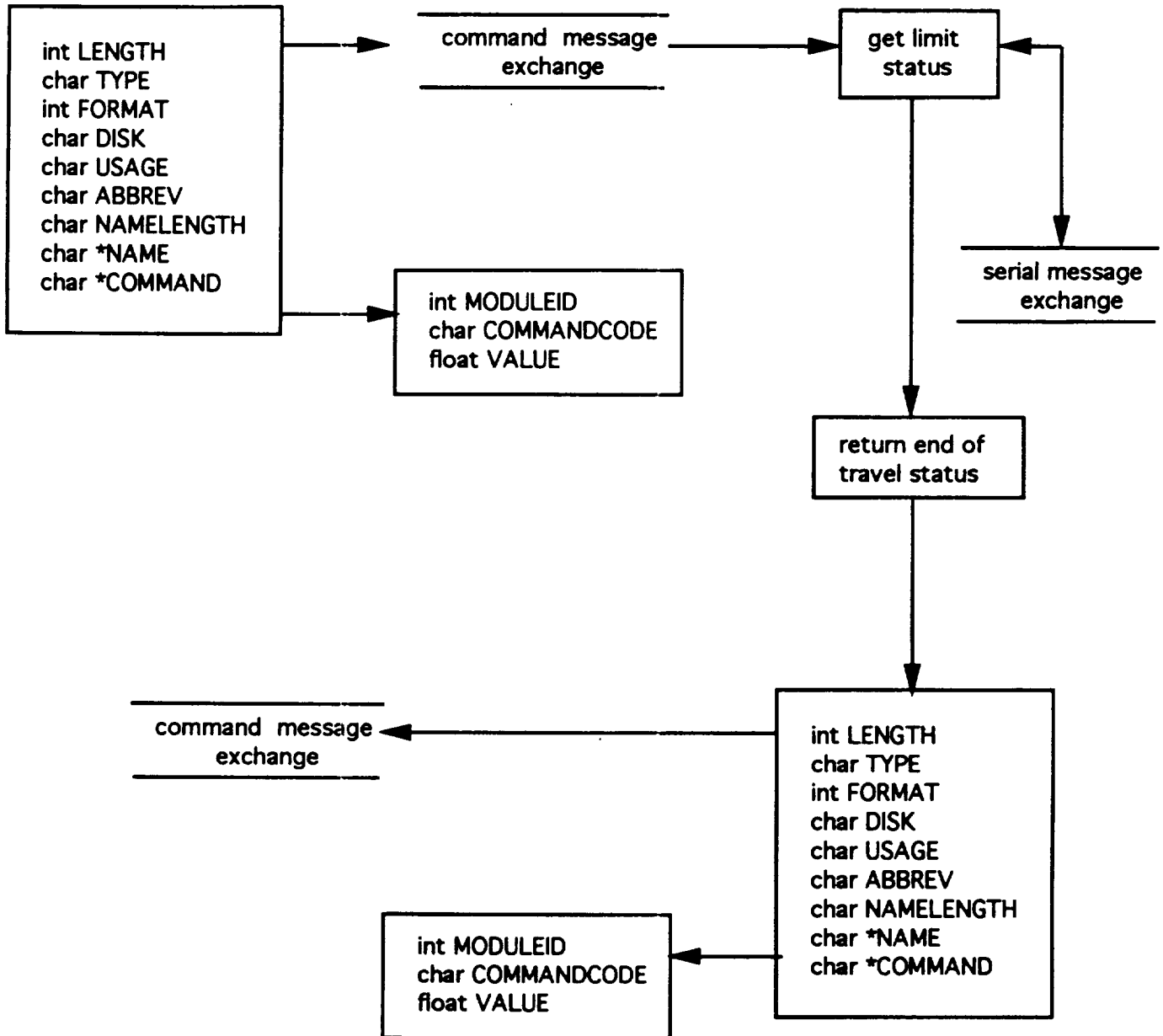
GRIP OVERFORCE OVERRIDE COMMAND COMMANDCODE #93



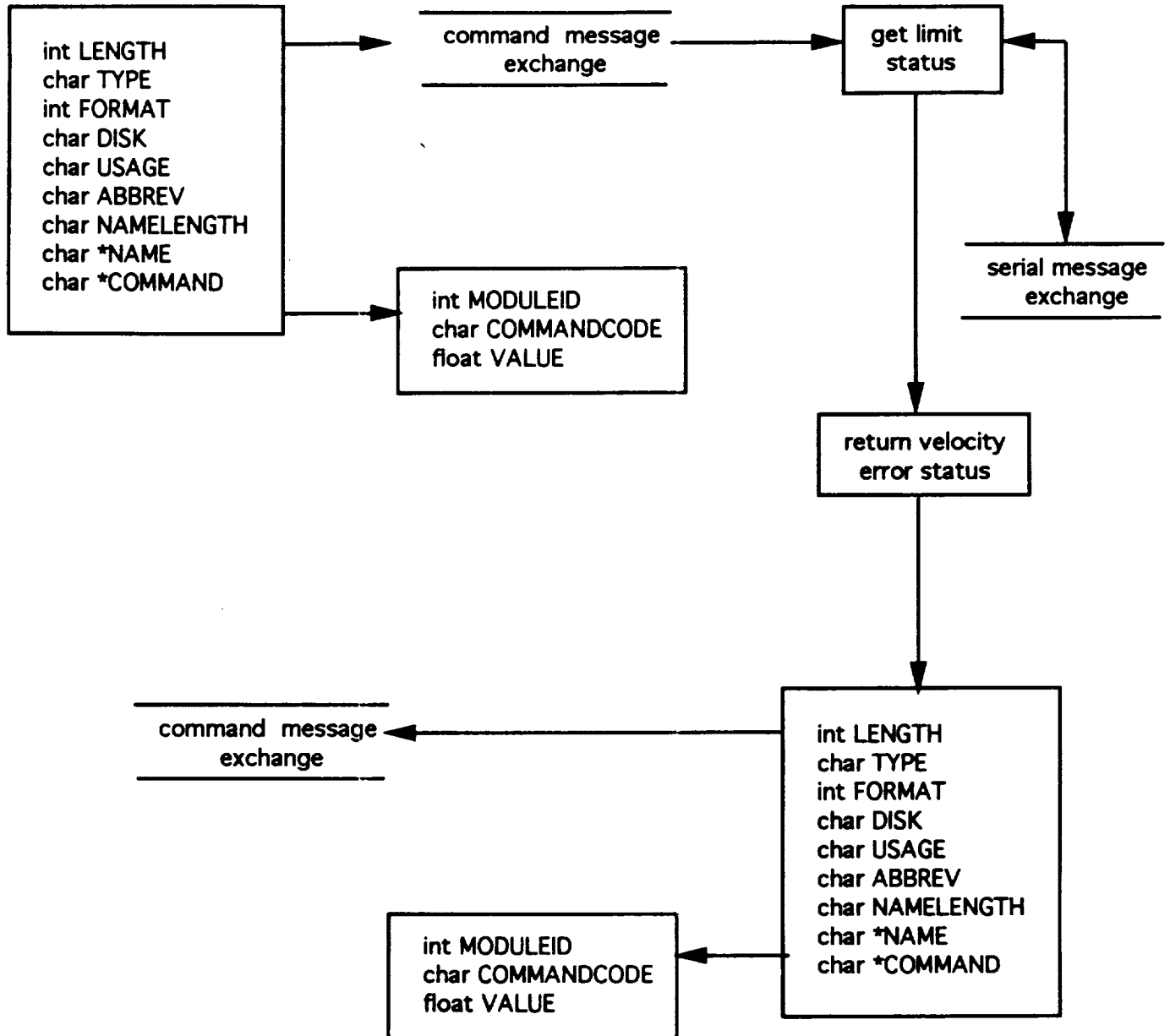
OVERFORCE STATUS COMMAND
COMMANDCODE #94



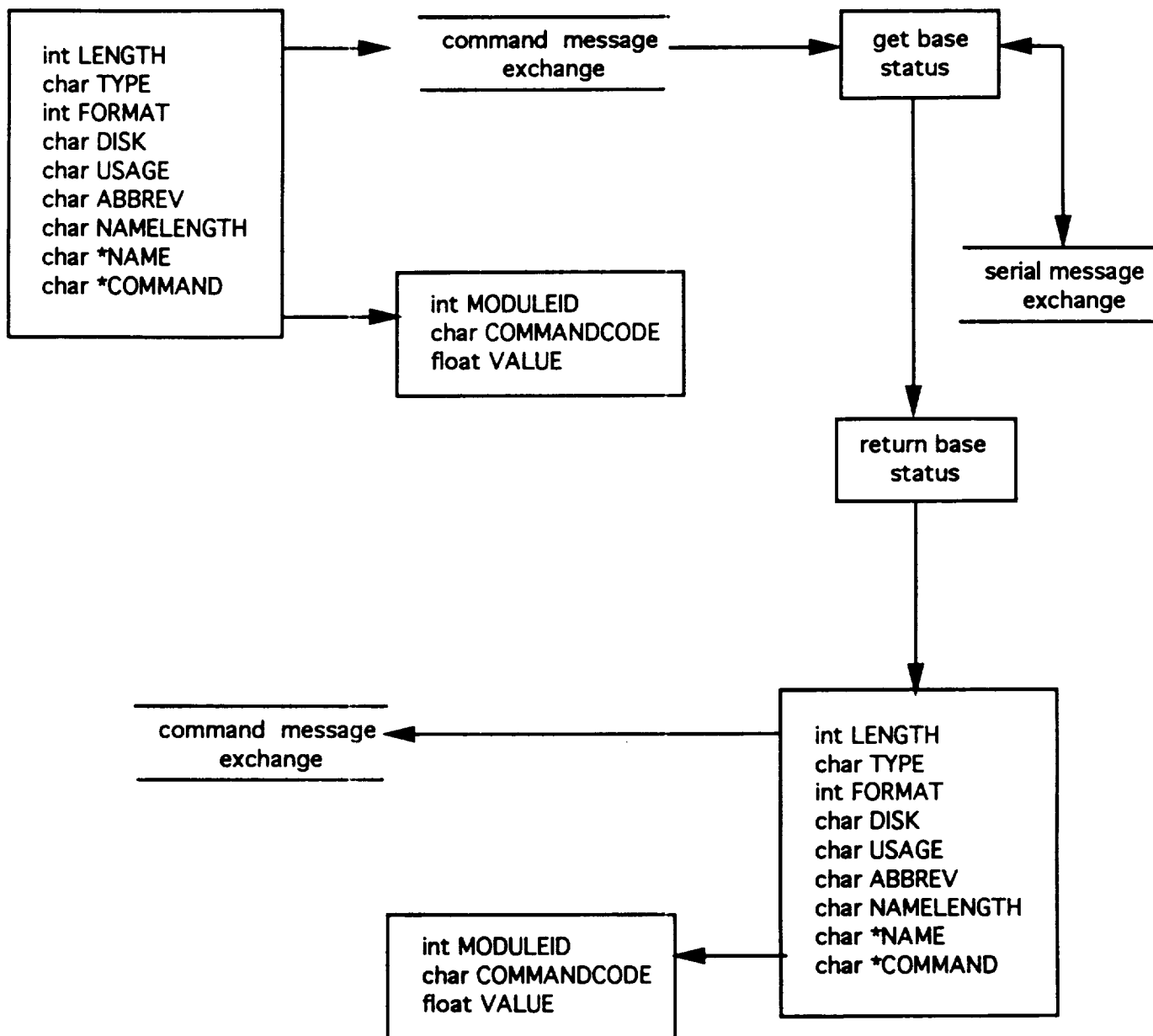
END OF TRAVEL STATUS COMMAND
COMMANDCODE #95



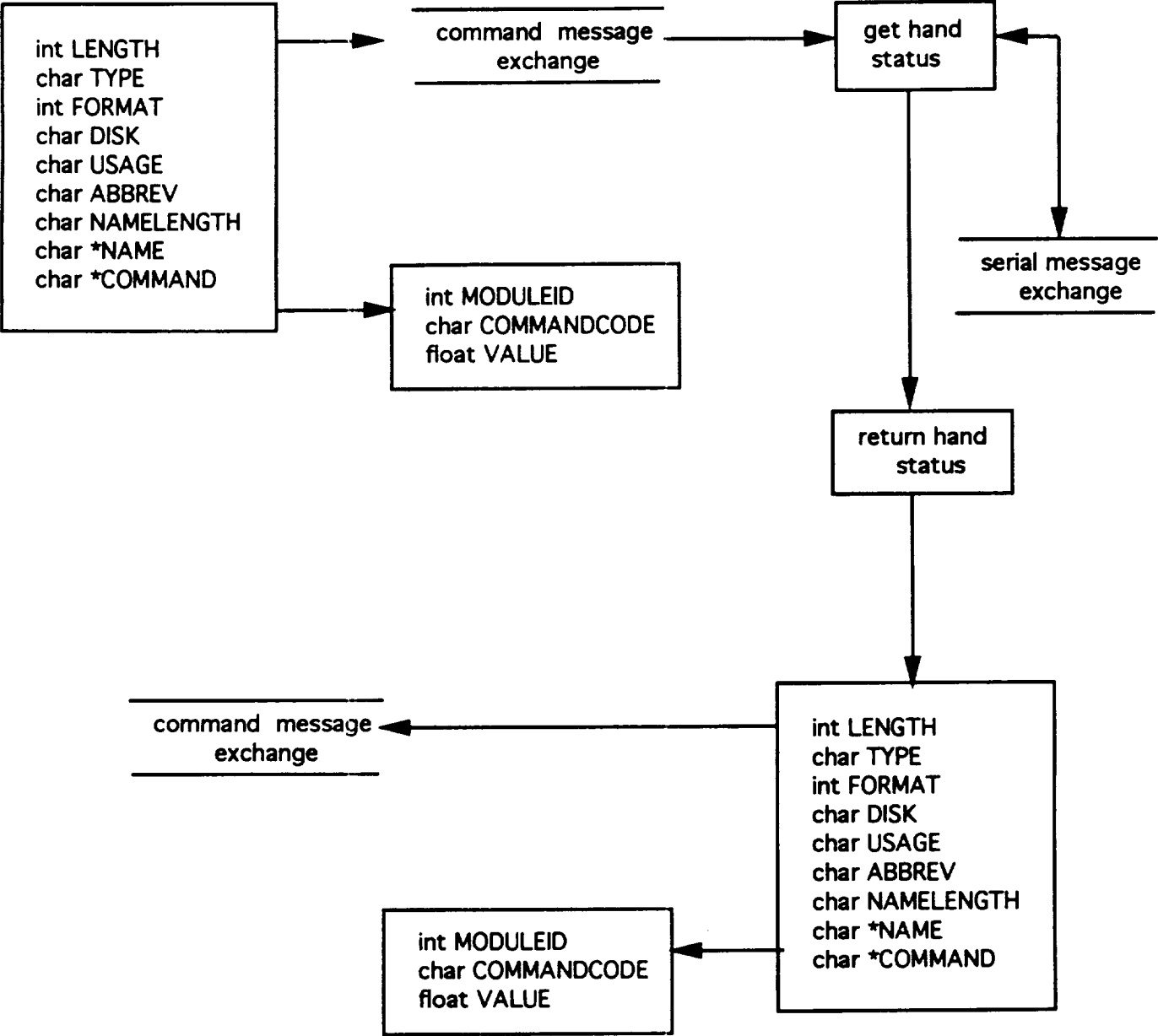
VELOCITY ERROR STATUS COMMAND
COMMANDCODE #96



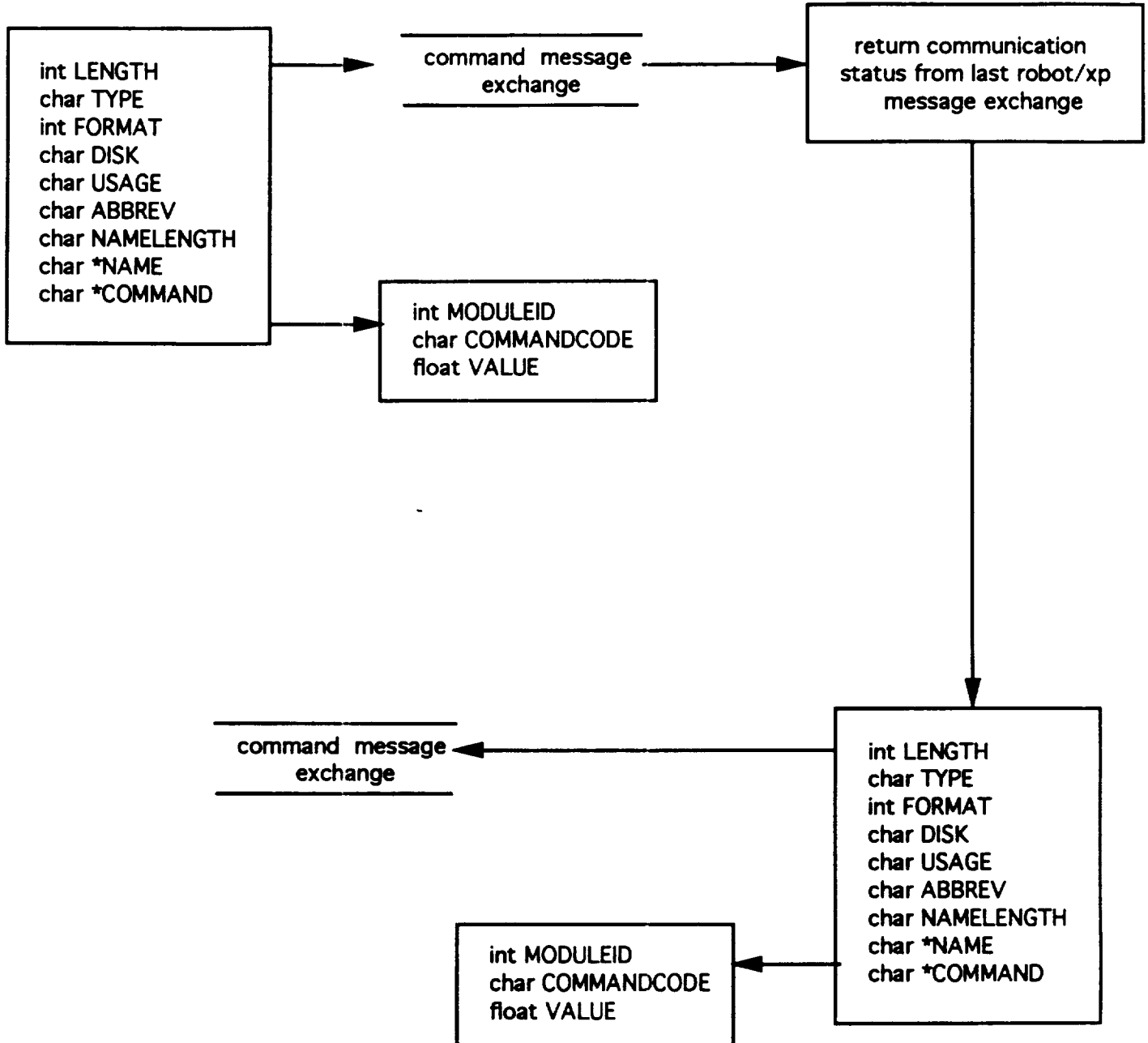
BASE MOVE STATUS COMMAND COMMANDCODE #97



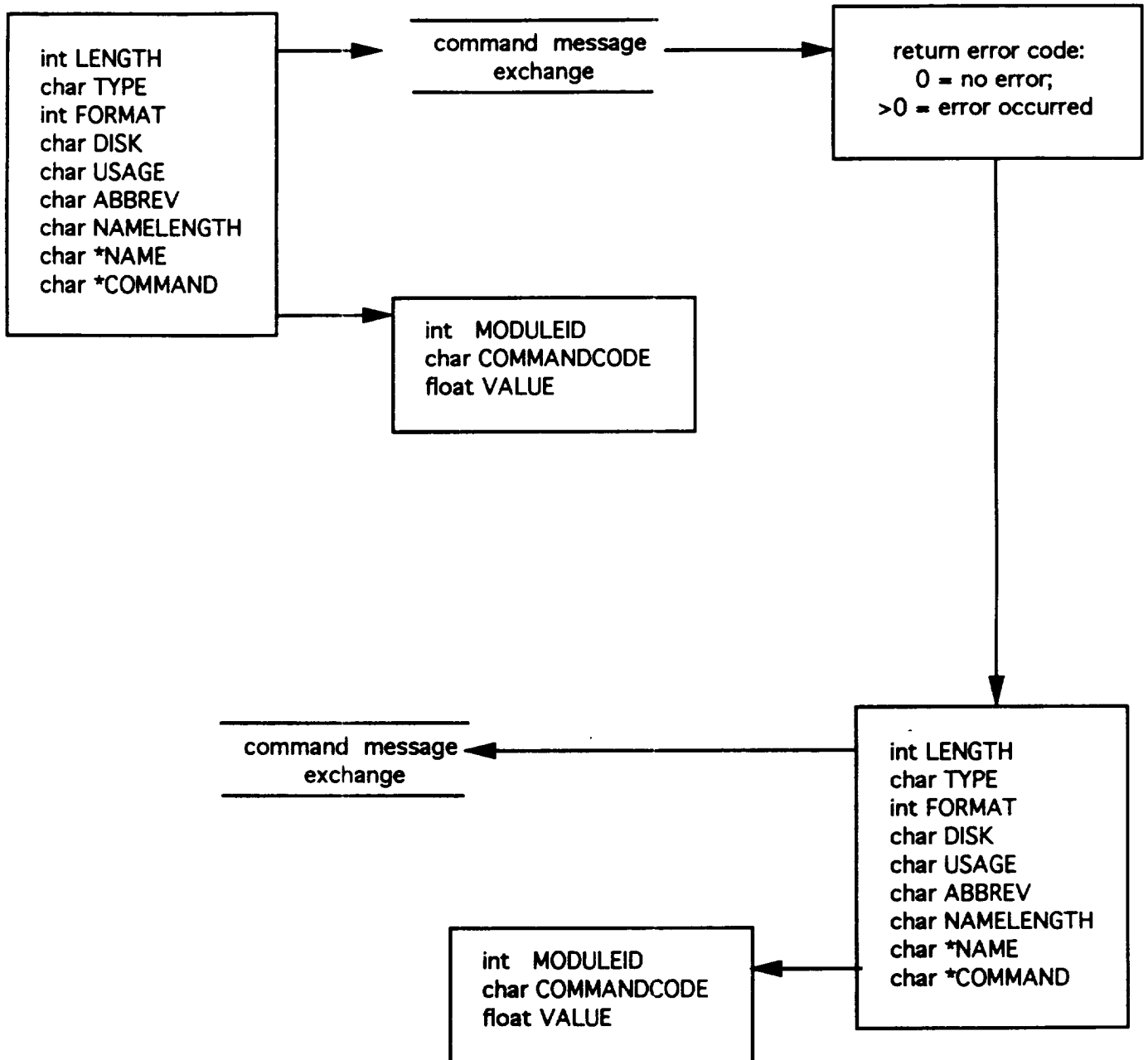
GRIP MOVE STATUS COMMAND
COMMANDCODE #98



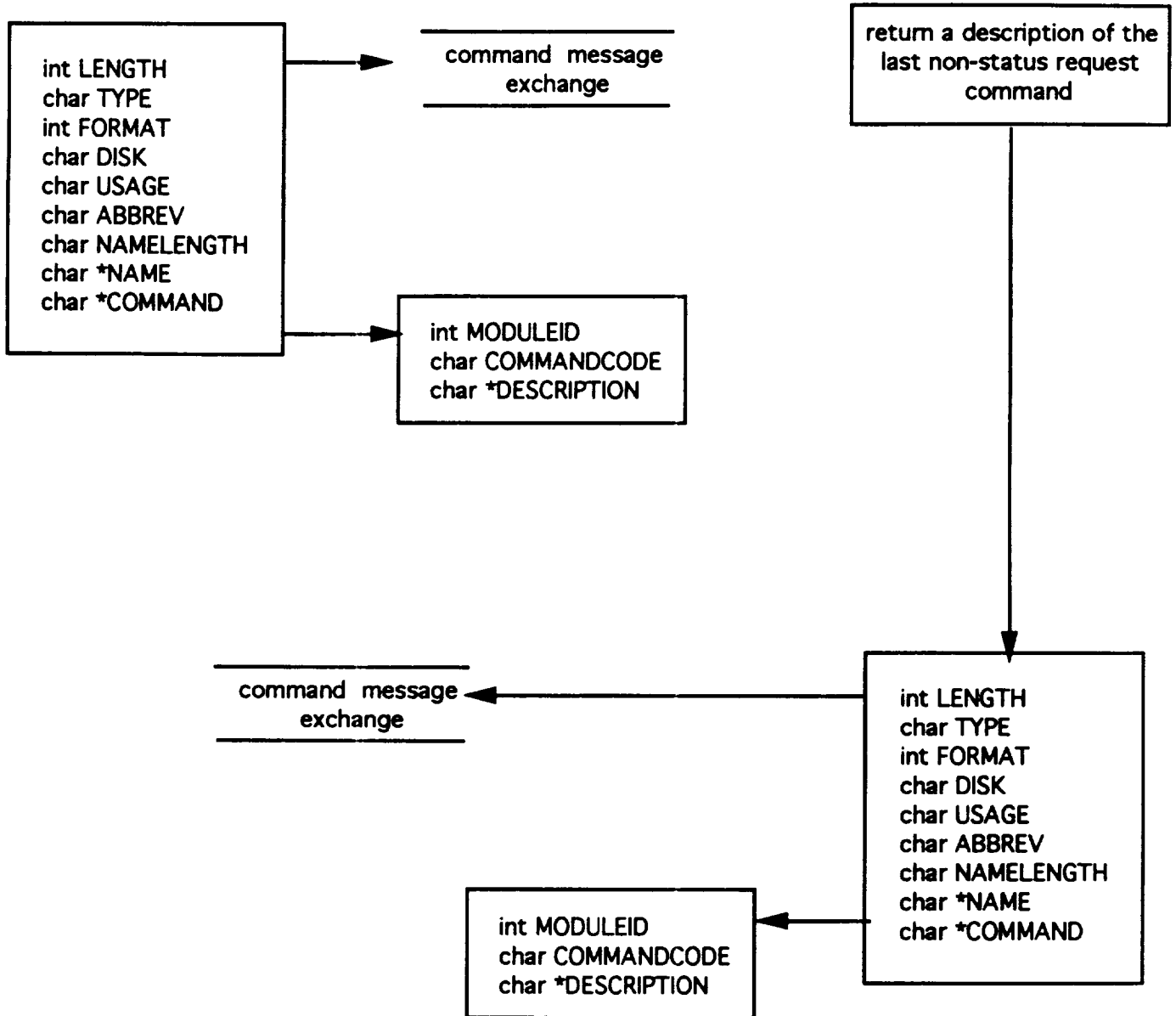
COMMUNICATION STATUS COMMAND COMMANDCODE #99



MODULE STATUS COMMAND
COMMANDCODE #100



ERROR DESCRIPTION COMMAND COMMANDCODE #101



EASYLAB PROGRAMS DEFINITIONS

ROBOT MODULE EASYPAB PROGRAMS

Space Automated Research Center (SpARC)

December 3, 1992

TABLE OF CONTENTS

GET.FROM.RACK2
PUT.INTO.RACK.....2
LAUNCHLOCK.....3

NAME: **GET.FROM.RACK**

SYNTAX: GET.FROM.RACK

DESCRIPTION: Get a sample from a rack. The rack number and sample number must be defined before this command is executed.

RETURNS: CK - successful return
 NOTOK - error return

In addition to a NOTOK error return, a message is printed on the terminal and S:MODULE.STATUS is set to indicate the error.

EXAMPLE: RACK.NUMBER = 1
 SAMPLE.NUMBER = 5
 GET.FROM.RACK

NAME: **PUT.INTO.RACK**

SYNTAX: PUT.INTO.RACK

DESCRIPTION: Put a sample into a rack. The rack number and sample number must be defined before this command is executed.

RETURNS: CK - successful return
 NOTOK - error return

In addition to a NOTOK error return, a message is printed on the terminal and S:MODULE.STATUS is set to indicate the error.

EXAMPLE: RACK.NUMBER = 1
 SAMPLE.NUMBER = 5
 GET.FROM.RACK

NAME: **LAUNCHLOCK**

SYNTAX: **LAUNCHLOCK**

DESCRIPTION: Move the robot arm to the launch lock position. This command puts the robot arm in a safe position for takeoff and landing.

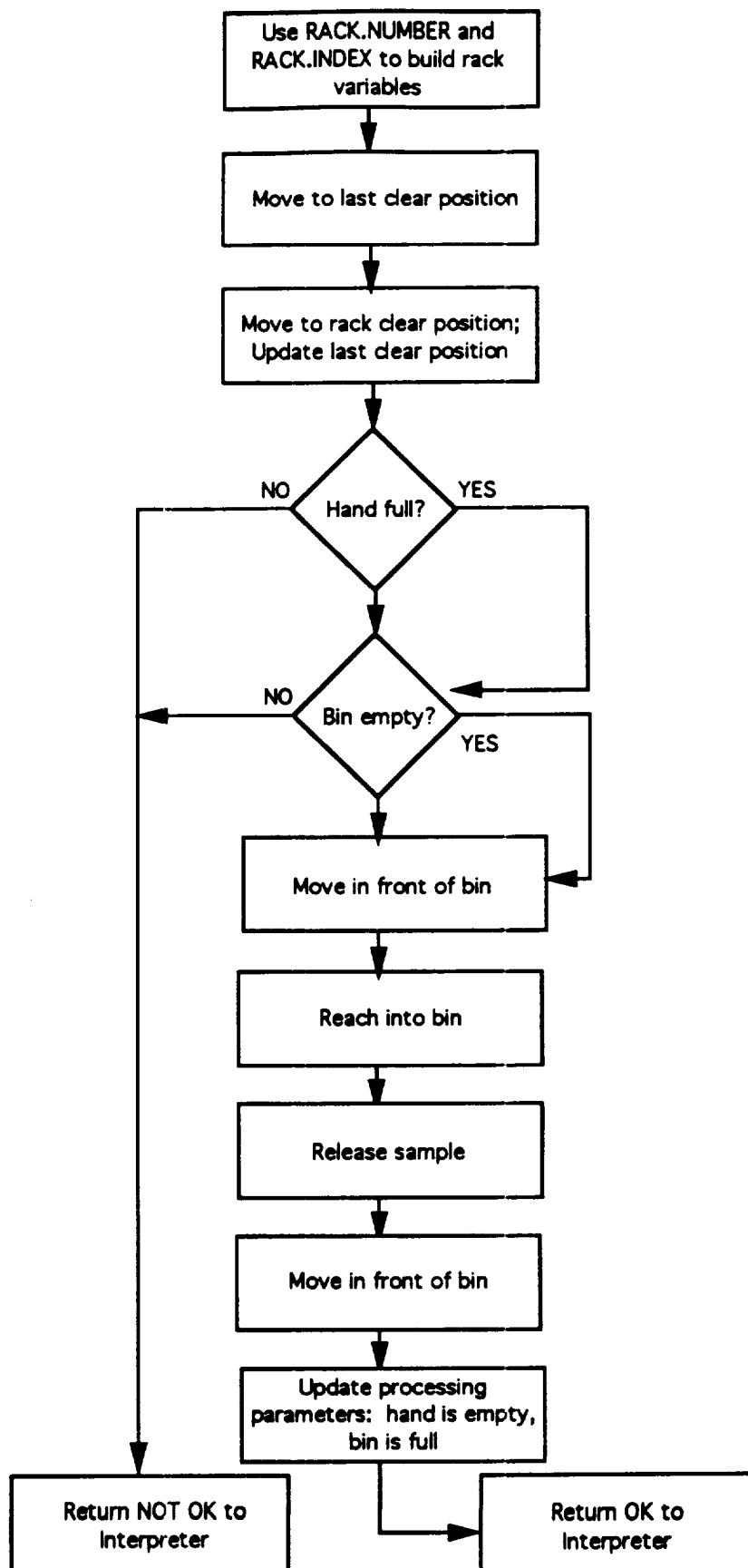
RETURNS: **OK** - successful return
 NOTOK - error return

In addition to a NOTOK error return, a message is printed on the terminal and S:MODULE.STATUS is set to indicate the error.

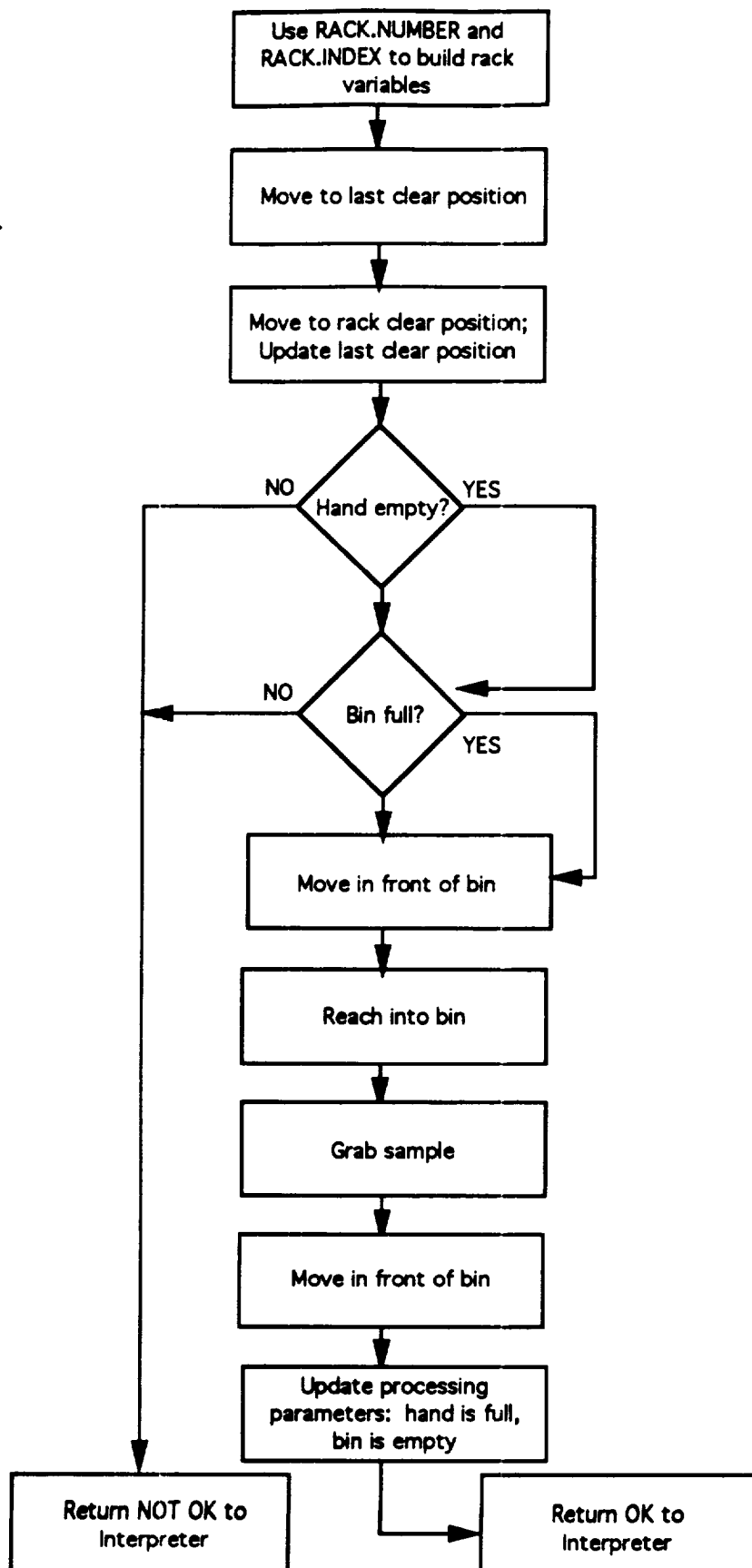
EXAMPLE: **LAUNCHLOCK**

**ROBOT
EASYPYLAB PROGRAMS
FLOW CHARTS**

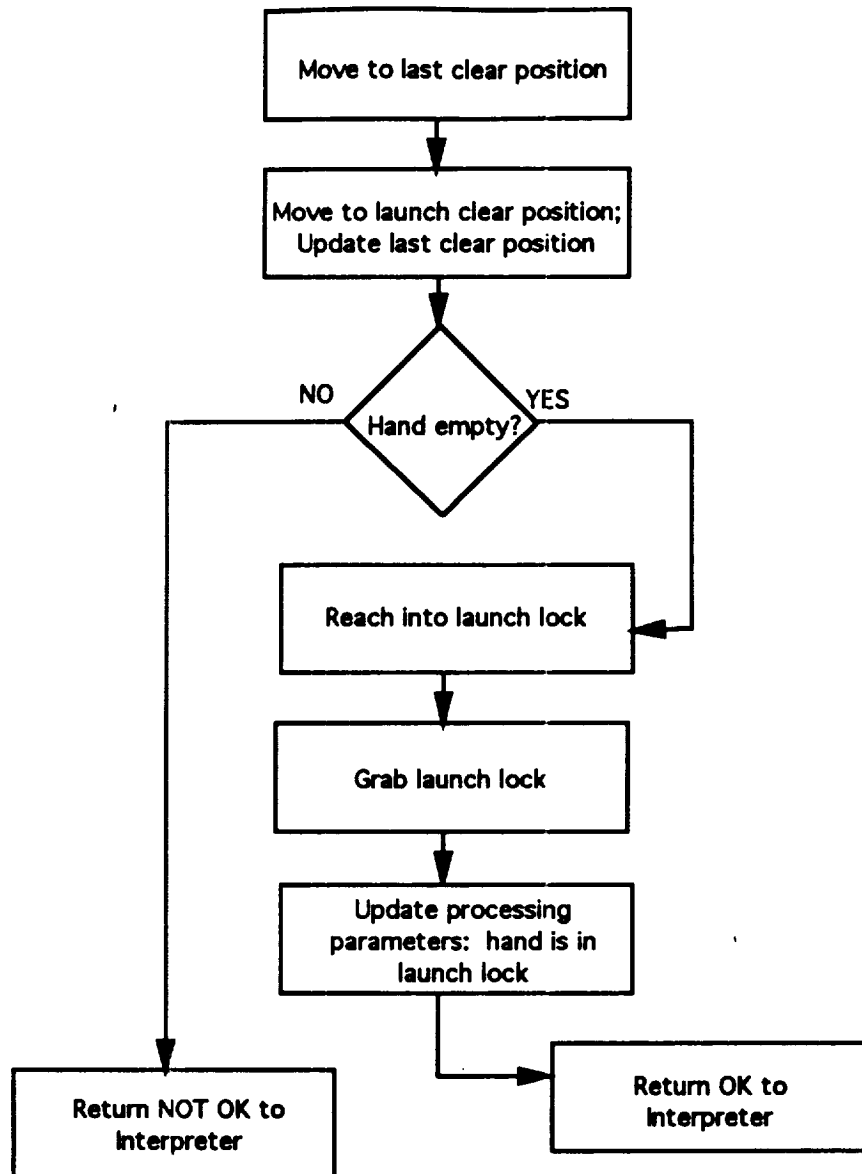
EASYPAC PROGRAM: PUT.INTO.RACK PROCESSING FLOW CHART



EASYPAC PROGRAM: GET.FROM.RACK
PROCESSING FLOW CHART



EASYPAC PROGRAM: LAUNCH.LOCK PROCESSING FLOW CHART



ROBOT MODULE FAULT CONDITIONS

ROBOT ERROR CONDITIONS

The Robot Module is capable of detecting the following types of errors:

Robot/XP Communication errors:

- Interbyte timeout
- Invalid byte count
- Invalid command code
- Invalid checksum

XP Processing Errors

- Elevation axis failed to reach position
- Elevation axis is in end of travel limit
- Elevation axis overforce
- Elevation axis stalled
- Radial axis failed to reach position
- Radial axis is in end of travel limit
- Radial axis overforce
- Radial axis stalled
- Azimuth axis failed to reach position
- Azimuth axis is in end of travel limit
- Azimuth axis stalled
- Gripper axis failed to reach position
- Gripper axis is in end of travel limit
- Gripper axis overforce
- Gripper axis stalled

Robot Processing Errors

- **WARNING.. ILLEGAL SET ABSOLUTE COMMAND**

Either the command variable does not exist or an absolute move was issued for a command variable of the wrong type

- **INDEX VALUE OUT OF RANGE FOR THIS RACK**

$1 < \text{rack index} < \text{row} * \text{col}$

- **STOP KEY PRESSED**

User pressed STOP key

- **ROBOT INIT ERROR AXIS: <axis>**

Initialization error on the specified axis

- **ENTRY NOT FOUND**

Command variable not found in data dictionary

- **CALIBRATION DATA IS OUT OF 10% ALLOWABLE RANGE**

The calibration data entered must be within 10% of the minimum and maximum axis range

- **MONUMENT DEFINITION CANNOT BE STORED IN DICTIONARY**

Error trying to store the monument definition

- **NAME CANNOT BE USED AS A MONUMENT POSITION**

A symbol exists with the same name but different type or is owned by someone else

- **MONUMENT MUST BE DEFINED BEFORE A HAND**

Monument position must be defined before the user can define a hand

- **NAME ALREADY USED - CANNOT BE STORED IN DICTIONARY**

Cannot use an existing hand name when defining a new hand

- **COMMAND IS NOT AN OUTPUT COMMAND**

Attempt to do an output operation on a command which is not an output command

- **COMMAND IS NOT FOR THIS ROBOT**

Attempt to execute a command which is not owned by the robot module

- **NOT IN POSITION**

An axis did not move to the desired location, either because the STOP key was pressed or because the XP could not position the axis correctly

- **ROBOT CANNOT SIGN ON**

Robot module cannot sign into the Zymate system

- **ROBOT VERSION IS NOT AVAILABLE**

Robot version is not stored in the data dictionary

- **HAND MUST BE ENTERED BEFORE A RACK CAN BE ACCESSED**

Attempt to move to a rack before picking up a hand

ROBOT STATUS COMMAND VARIABLES

The following list defines the Robot Status Command Variables and their values:

S:OVF.STATUS

Bit 0	Gripper Left is in OVF Open
Bit 1	Gripper Left is in OVF Closed
Bit 2	Gripper Right is in OVF Open
Bit 3	Gripper Right is in OVF Closed
Bit 4	Radial axis is in OVF In
Bit 5	Radial axis is in OVF Out
Bit 6	Elevation axis is in OVF Up
Bit 7	Elevation axis is in OVF Down

S:EOT.STATUS

Bit 0	Gripper is in EOT Open
Bit 1	Gripper is in EOT Closed
Bit 2	Azimuth axis is in EOT Left
Bit 3	Azimuth axis is in EOT Right
Bit 4	Radial axis is in EOT In
Bit 5	Radial axis is in EOT Out
Bit 6	Elevation axis is in EOT Up
Bit 7	Elevation axis is in EOT Down

S:VA.STATUS

Bit 0	Gripper Stalled
Bit 1	Azimuth Stalled
Bit 2	Radial Stalled
Bit 3	Elevation Stalled
Bit 4	Not used
Bit 5	Not used
Bit 6	Not used
Bit 7	Not used

S:BASE.STATUS

Bit 0	Azimuth axis failed to reach position
Bit 1	Elevation axis failed to reach position
Bit 2	Radial axis failed to reach position

Bit 3	Bad calibration data in ROM
Bit 4	Not used
Bit 5	Not used
Bit 6	Not used
Bit 7	Not used

S:GRIP.STATUS

Bit 0	Not used
Bit 1	Not used
Bit 2	Grip failed to reach position
Bit 3	Not used
Bit 4	Not used
Bit 5	Grip to force task active
Bit 6	Not used
Bit 7	Not used

S:COMM.STATUS

0x10	Invalid checksum
0x20	Invalid command code
0x40	Invalid byte count
0x80	Interbyte timeout

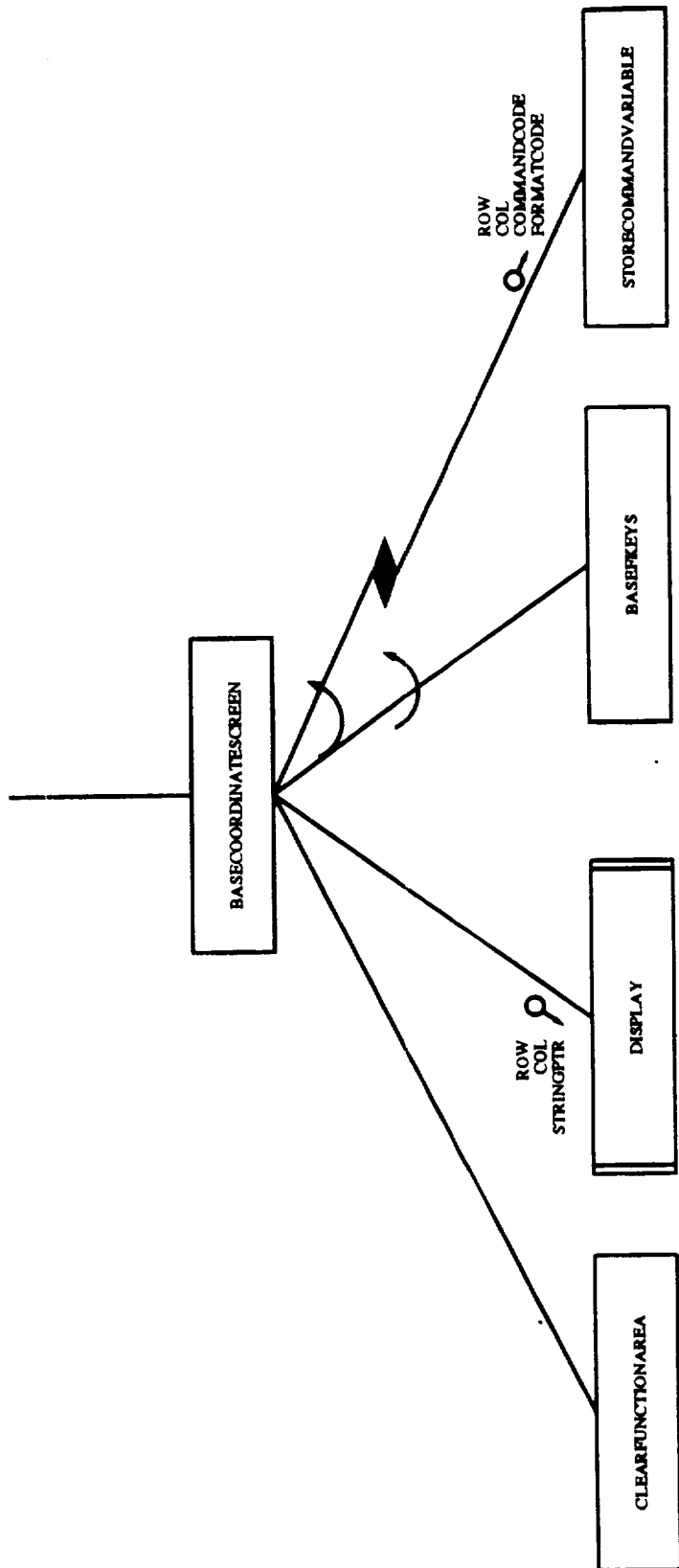
S:ROBOT.STATUS

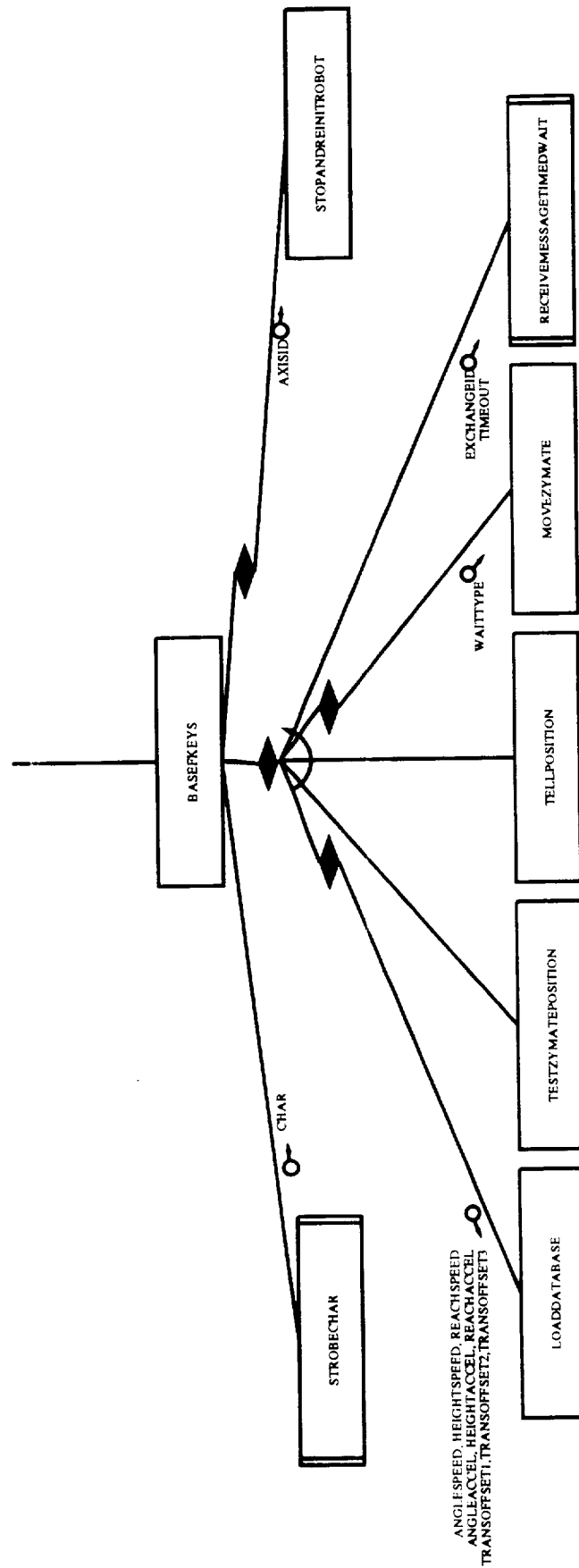
1	Hard Abort
2	User Stop
3	Robot/Xp Communication Error
4	End Of Travel Fault
5	Overforce Fault
6	Velocity Anomaly fault
7	Base Axis fault
8	Gripper fault
9	Robot cannot sign on
10	Robot version is not available
11	Invalid command
12	Command is not for this robot
13	Memory request denied
14	Dictionary entry does not exist
15	Dictionary entry already exists
16	Illegal rack index

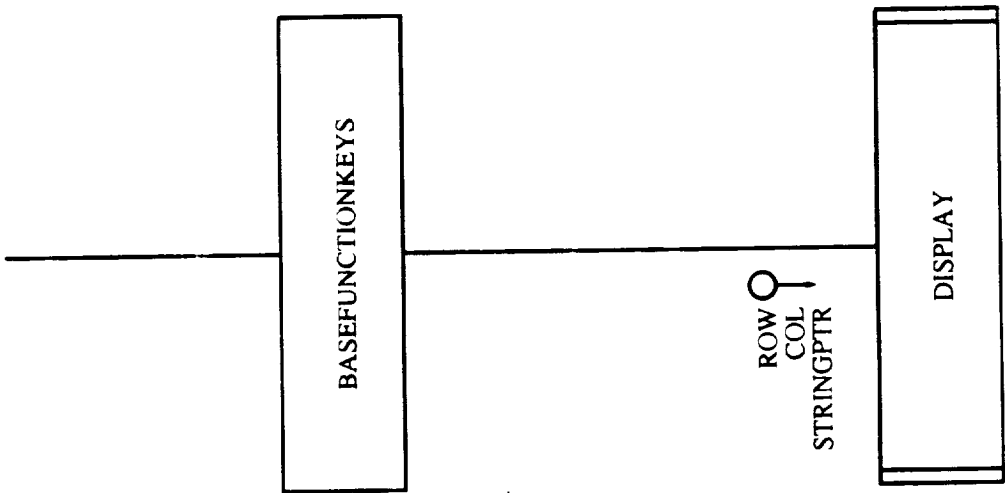
Robot Module Software Fault Handling Summary

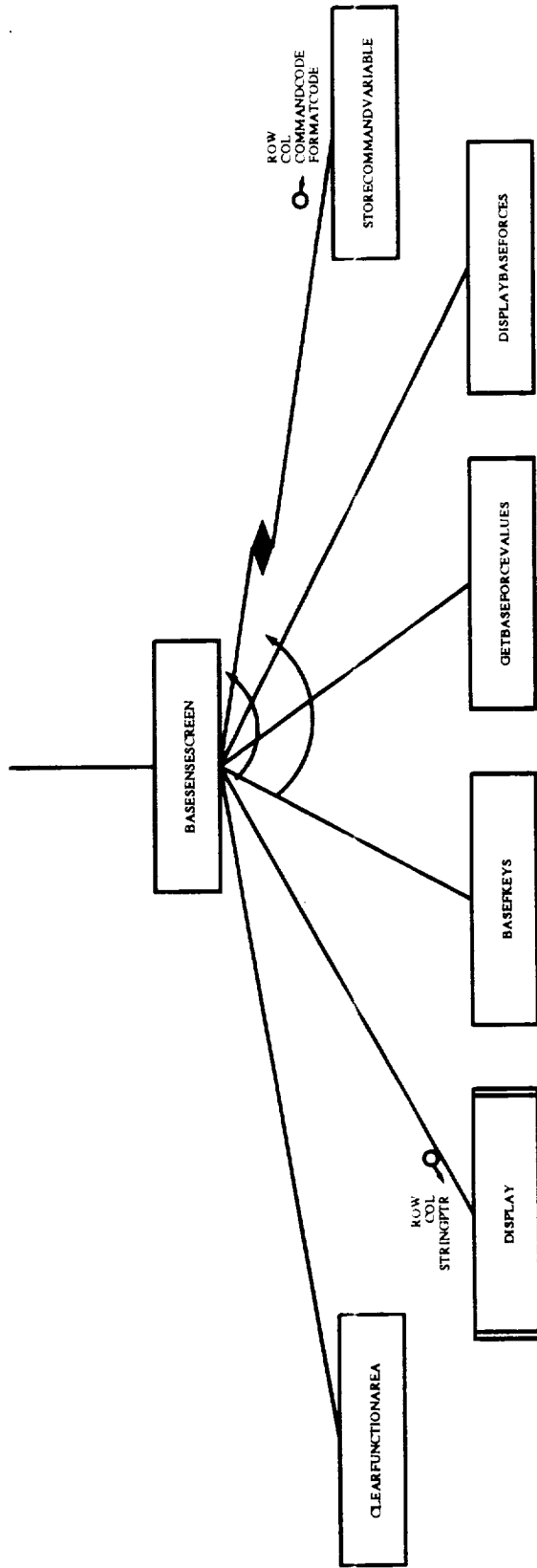
Fault Condition	Fault Detection	Fault Response
STOP EZC Processing	User presses STOP key OR System ISR updates EZC Processing status monitored by Robot Stop Task.	Robot Stop Task sends "STOP ROBOT" command to XP Servo Controller. Robot Task updates Error Status and terminates command.
Robot/XP Communication Error	Robot Task sends a message to the XP Servo Controller; XP Servo Controller sends a one byte error code in response.	Robot Task attempts to send the message until the retries are exhausted, then updates Error Status and terminates command.
End of Travel, Overforce, or Velocity Anomaly Fault	Robot Task sends a "READ LIMIT STATUS" message to the XP Servo Controller; XP Servo Controller sends three status bytes in response.	Robot Task updates Error Status and terminates command.
Axis Failed to Reach Position	Robot Task sends a "READ MOVE STATUS" message to the XP Servo Controller; XP Servo Controller sends one status byte in response.	Robot Task updates Error Status and terminates command.
Invalid Command	Robot Task compares Command Code to valid Command Codes.	Robot Task updates Error Status and terminates command.
Command Is Not For This Robot	Robot Task compares Command Module ID to it's own Module ID	Robot Task updates Error Status and terminates command.
Illegal Rack Index	Robot Task compares the Command Rack Index with the number of rows multiplied by the number of columns in the rack.	Robot Task updates Error Status and terminates command.

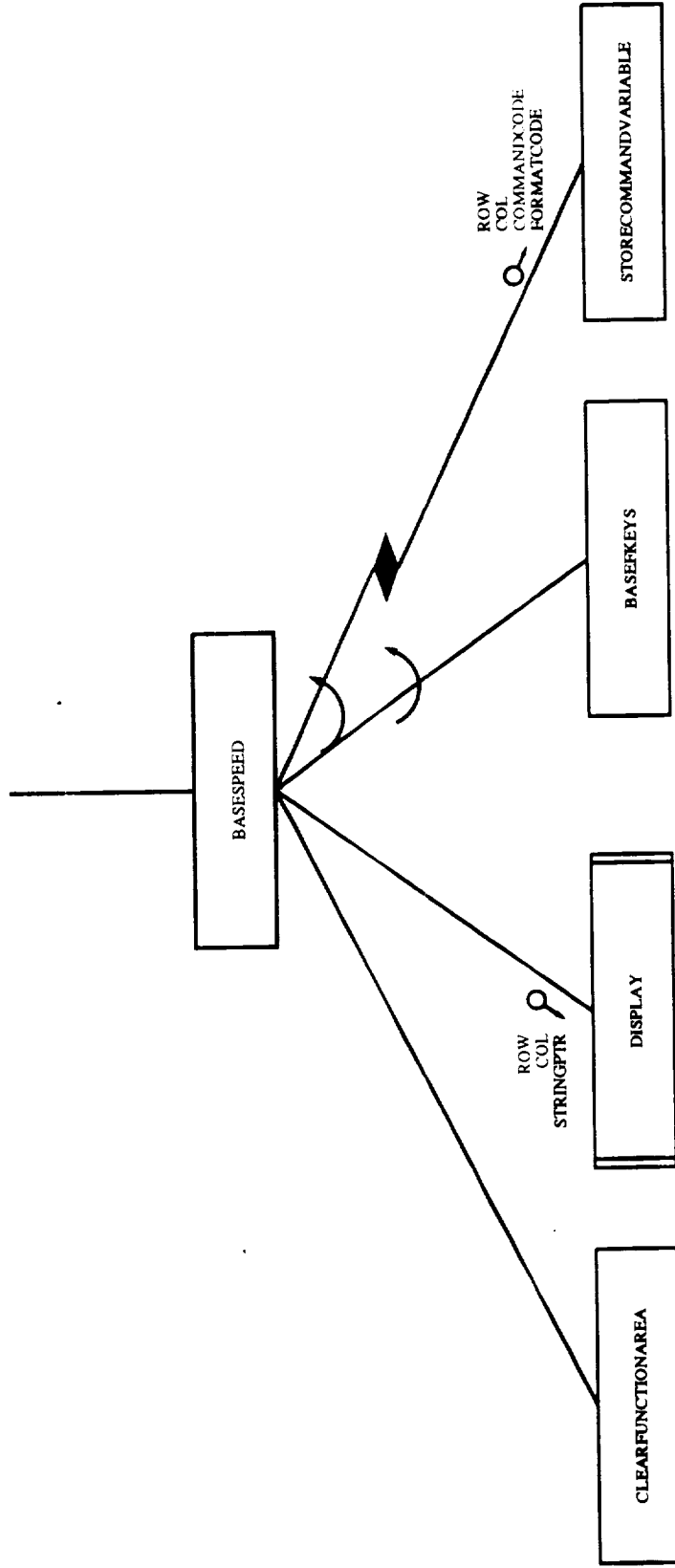
ROBOT MODULE STRUCTURE CHARTS

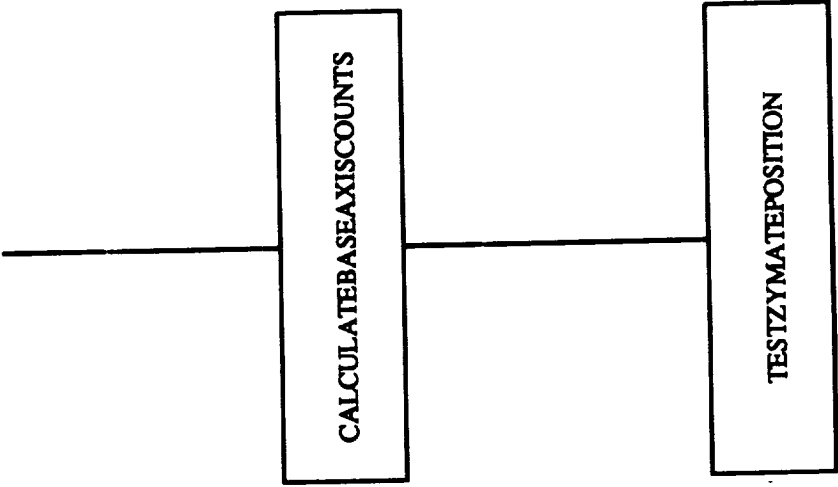


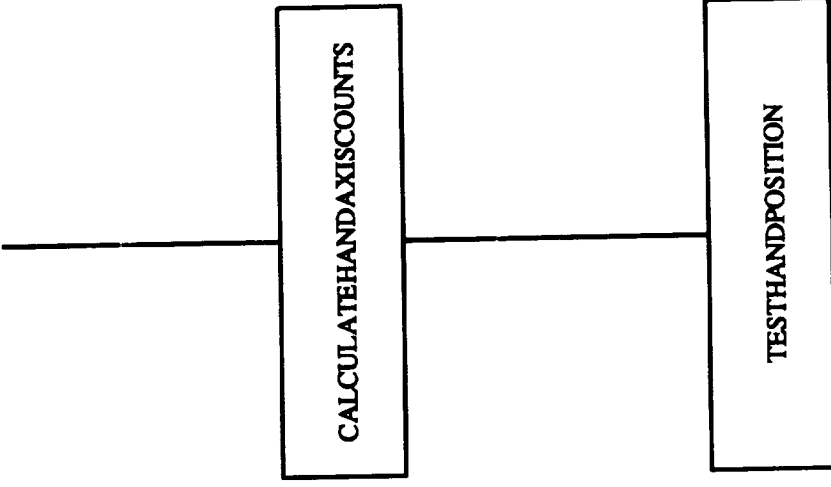


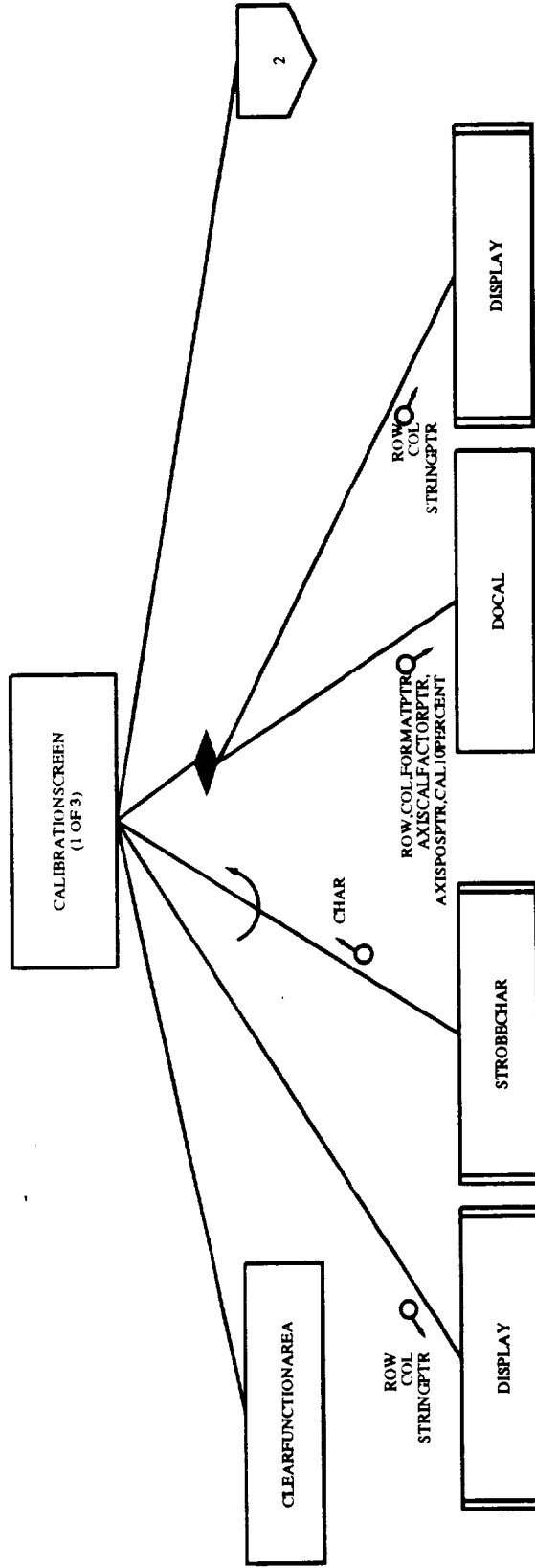


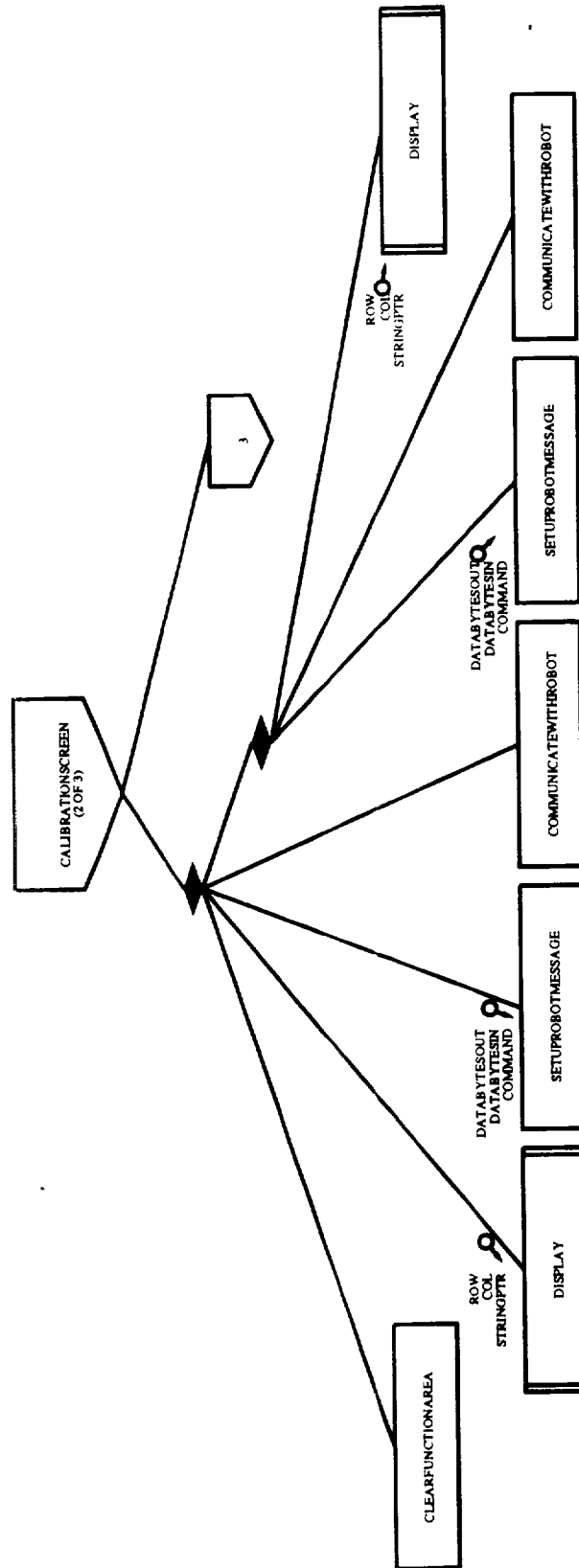


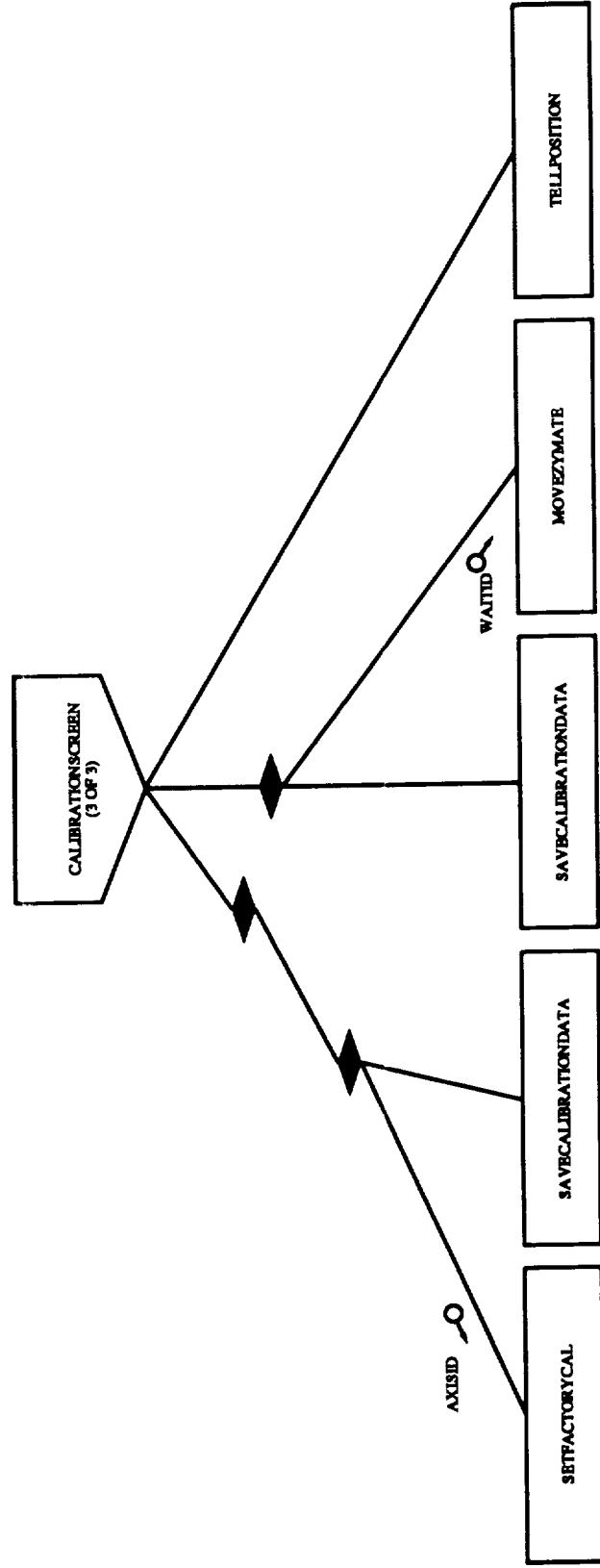


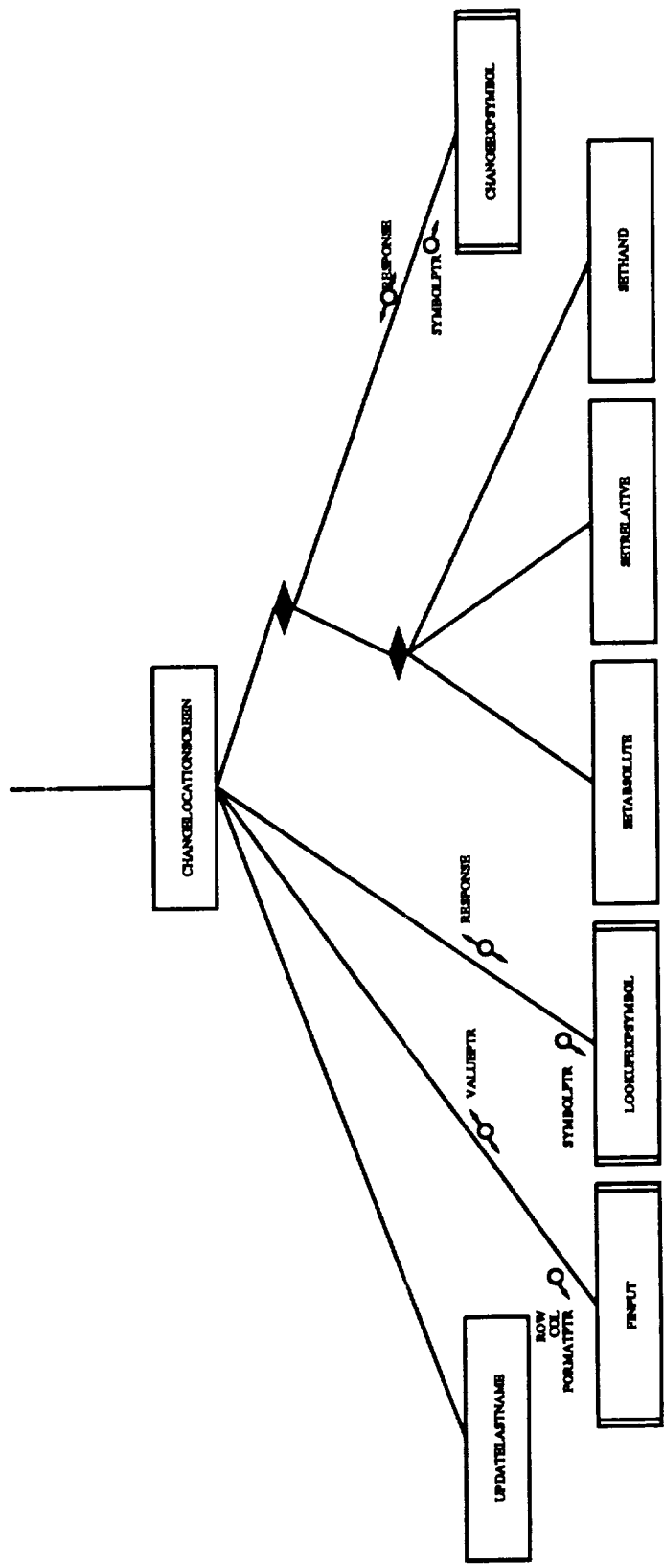


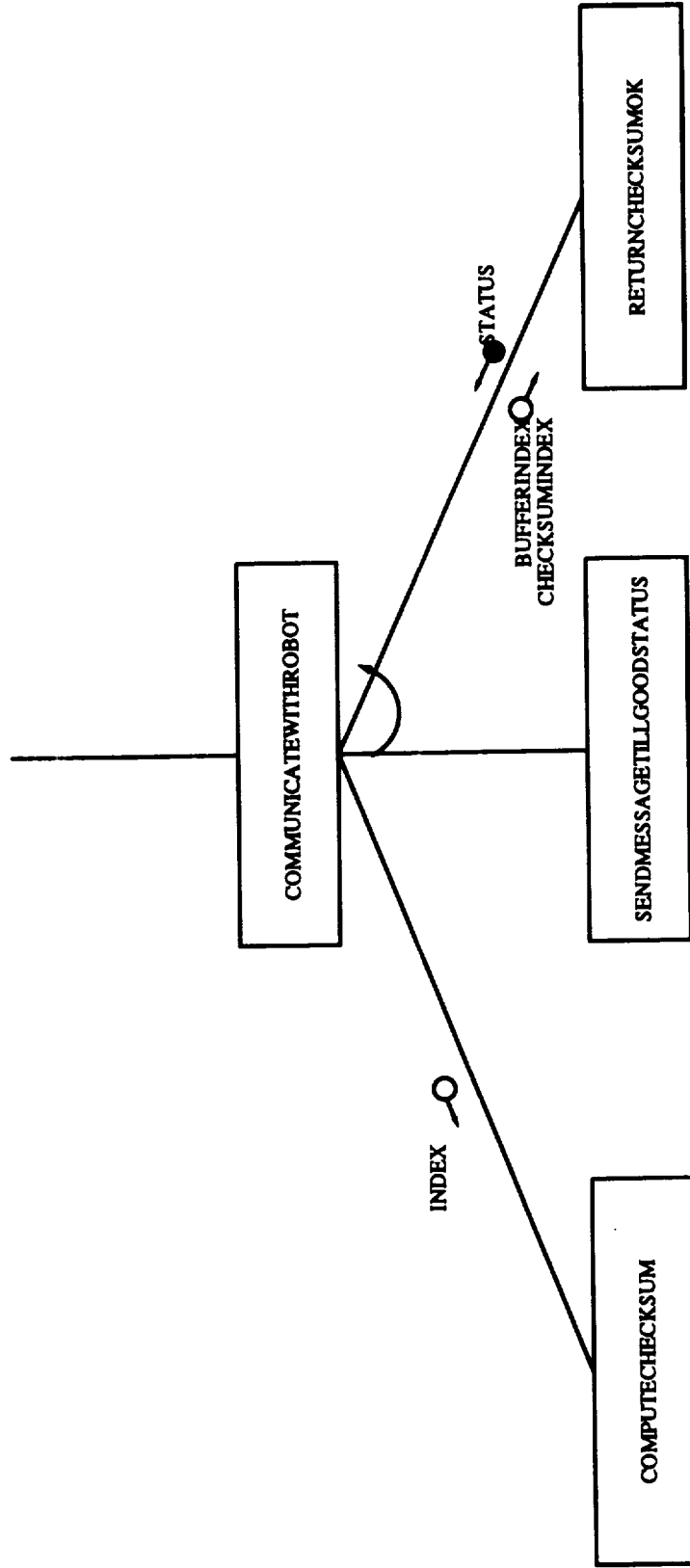


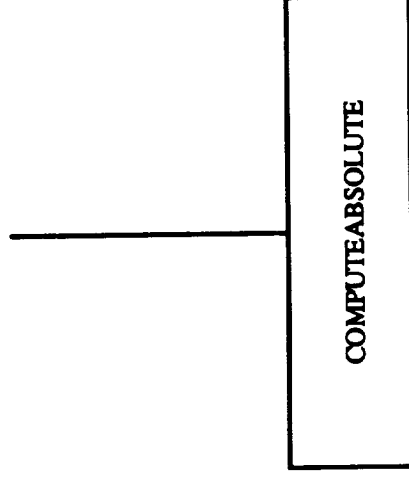






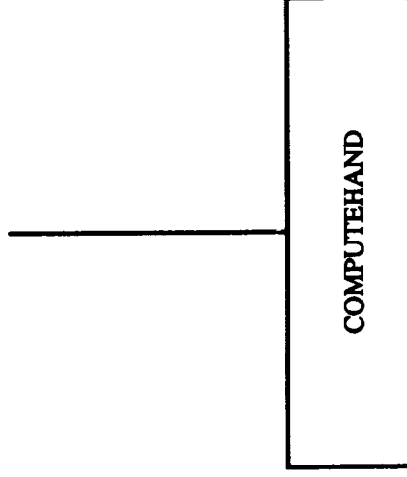




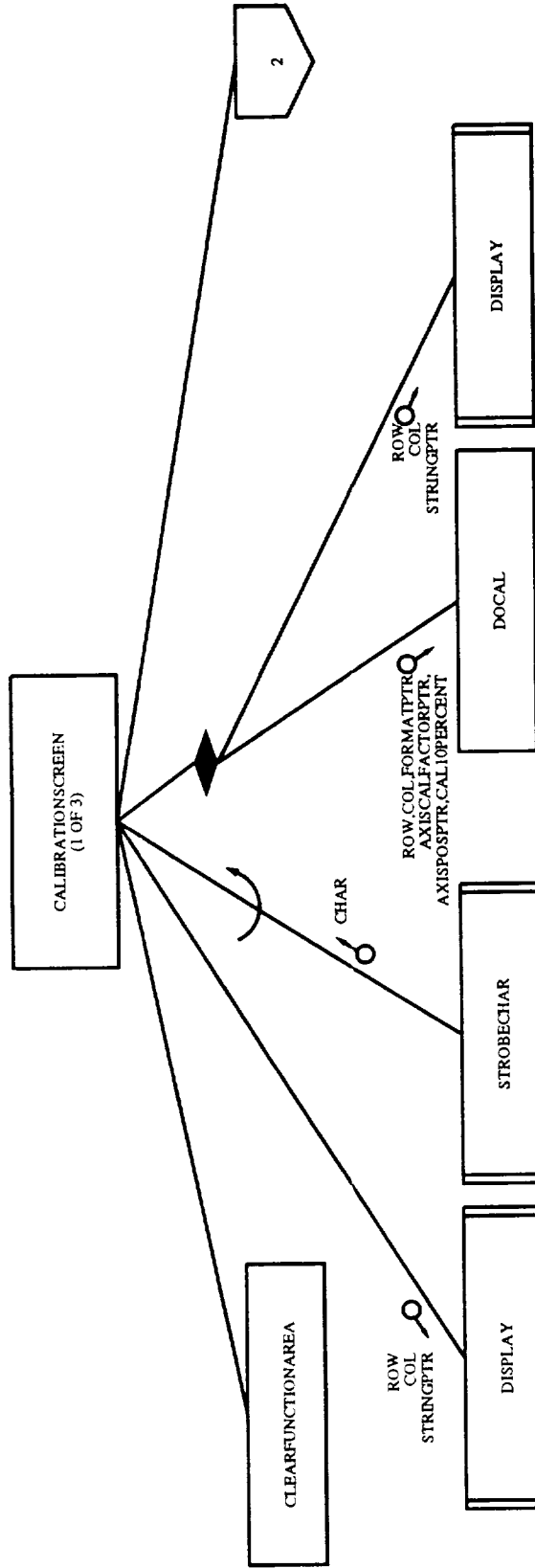


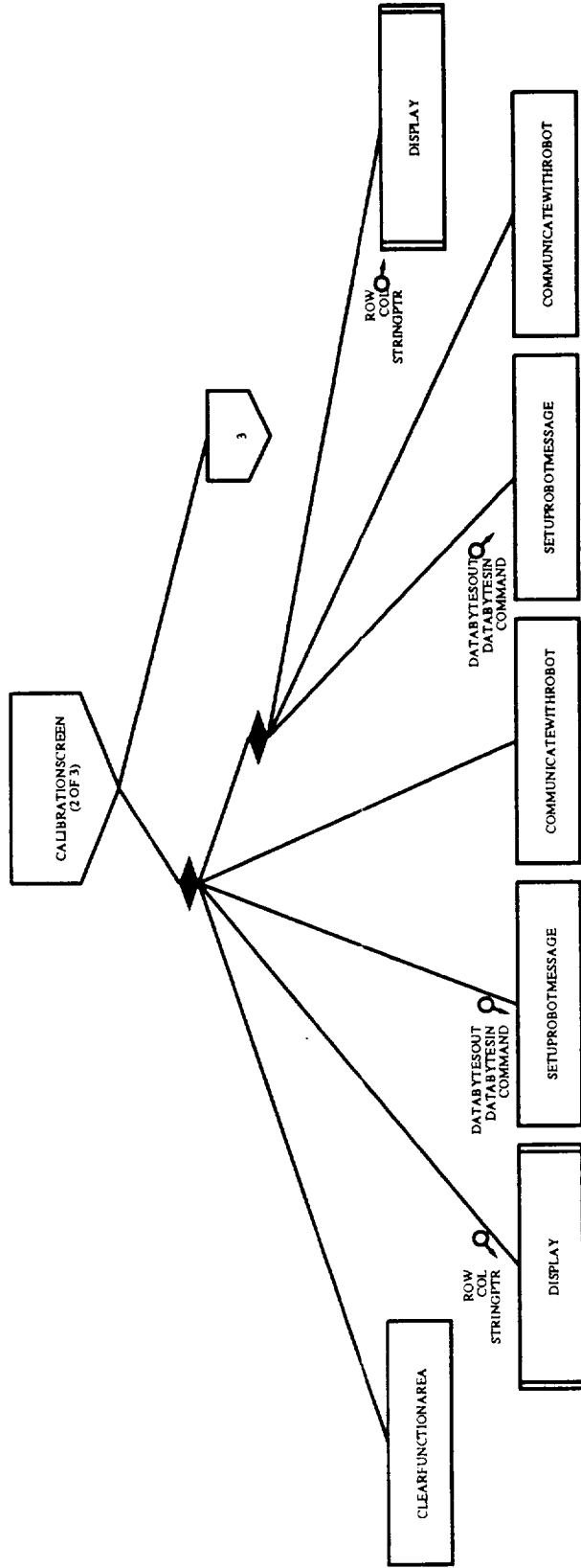
INDEX

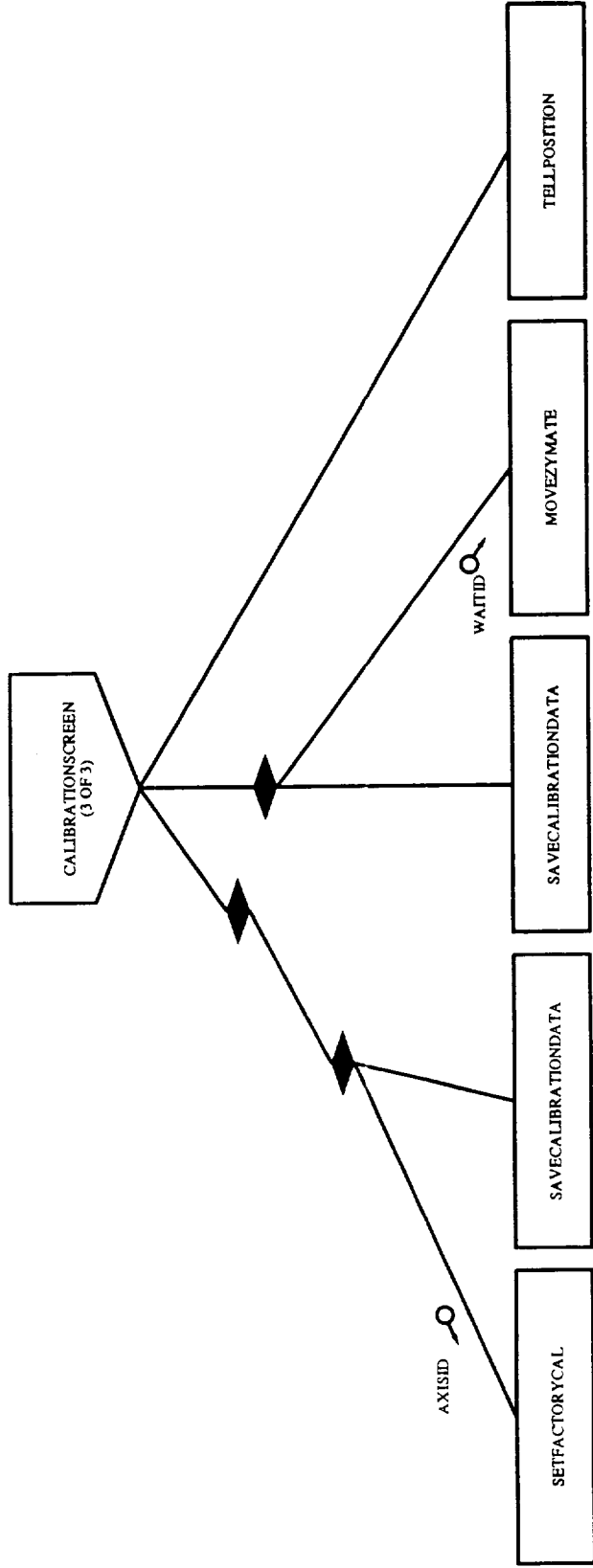
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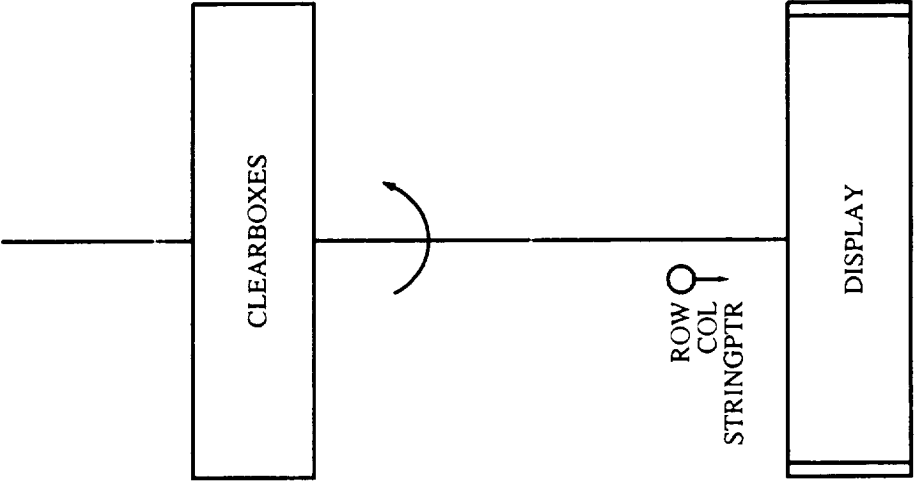


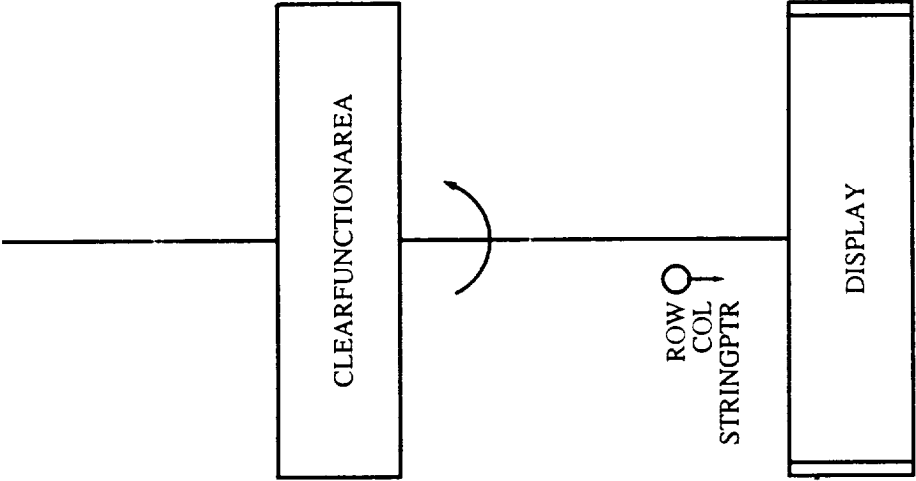
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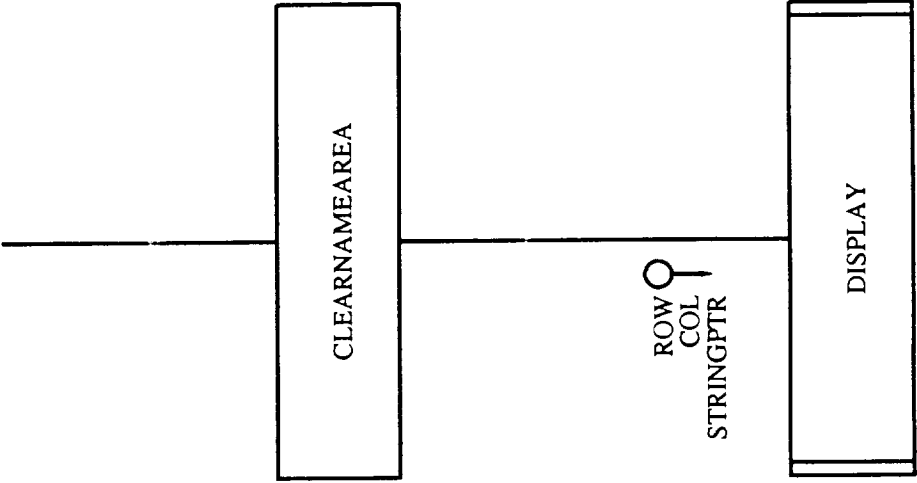


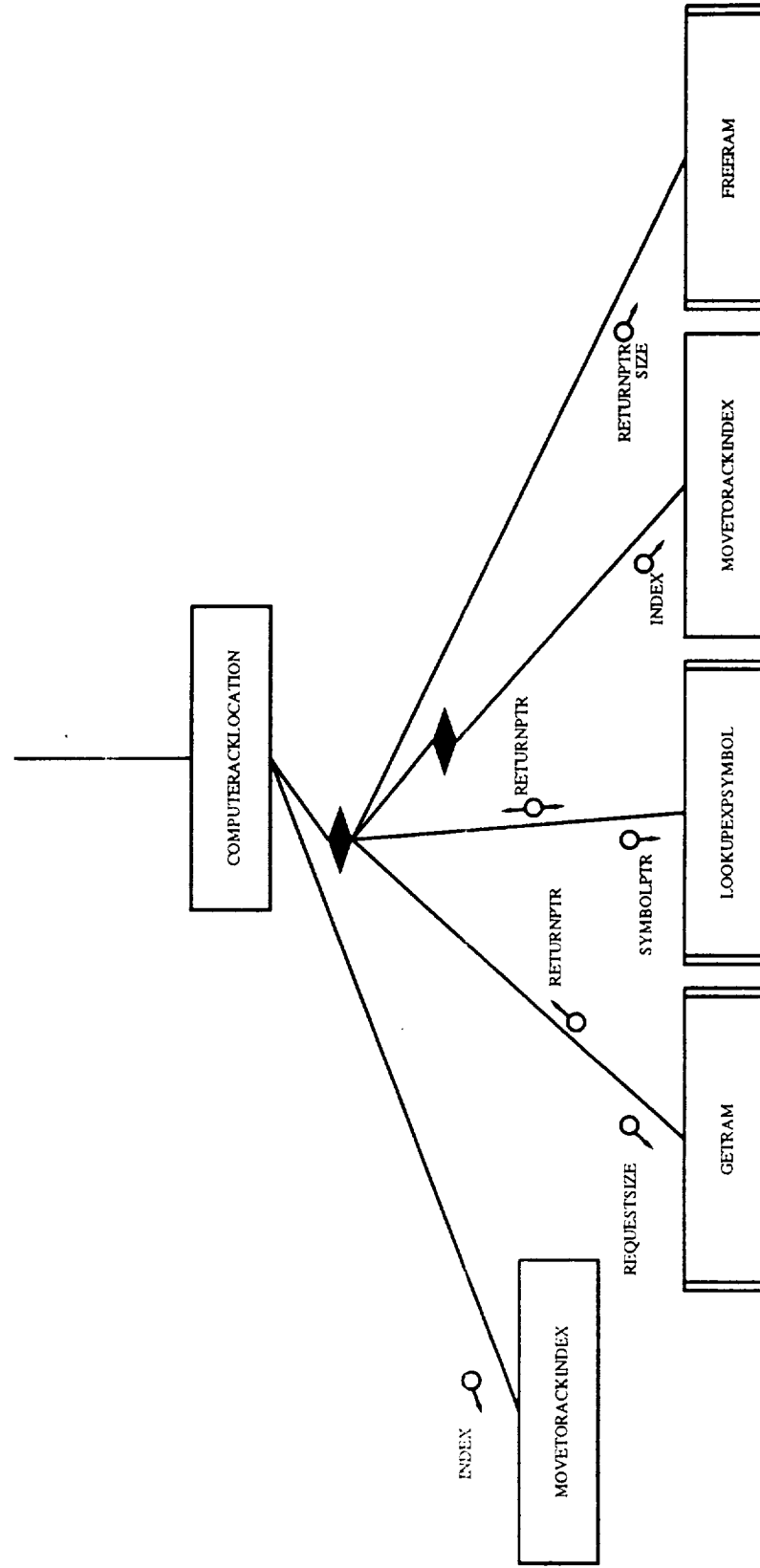


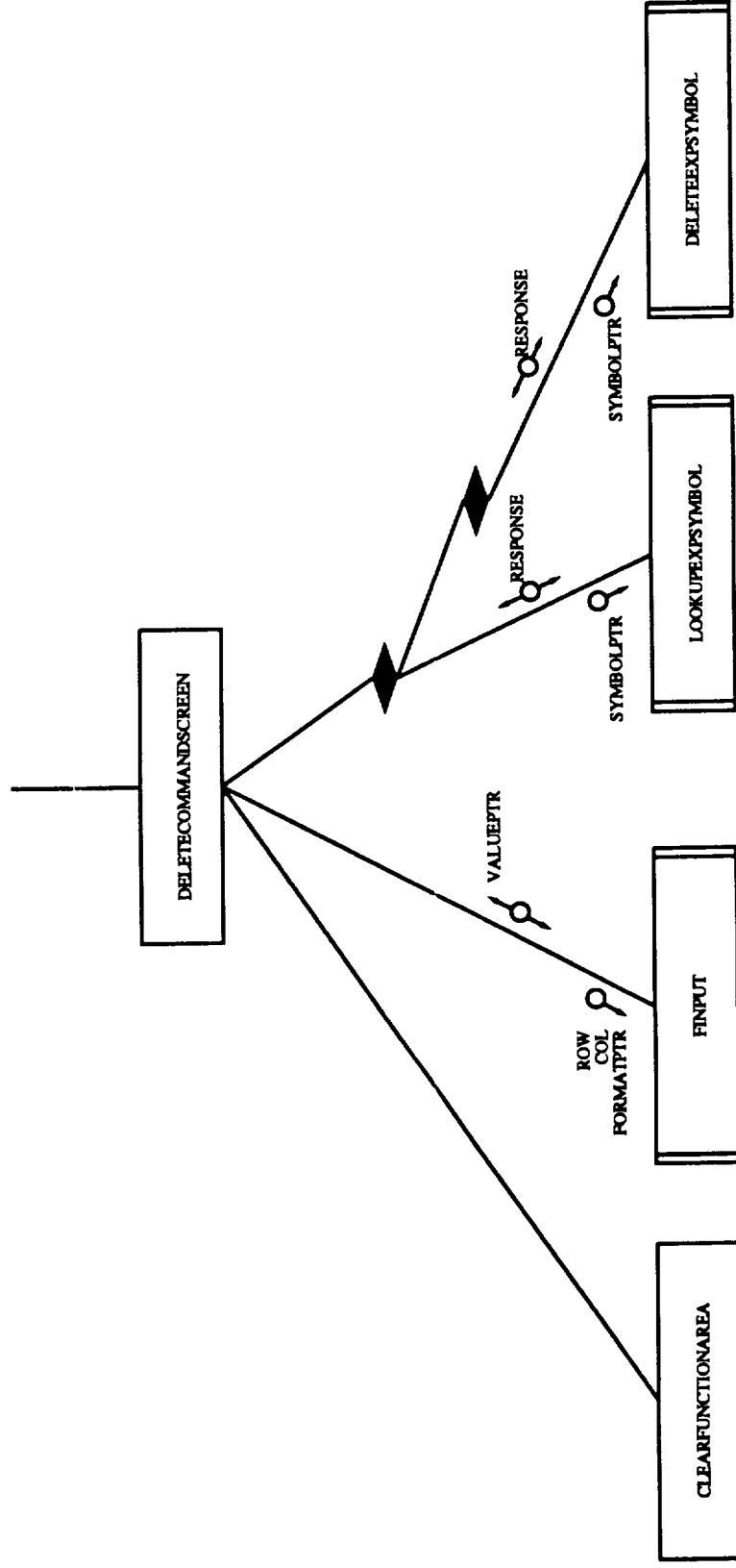


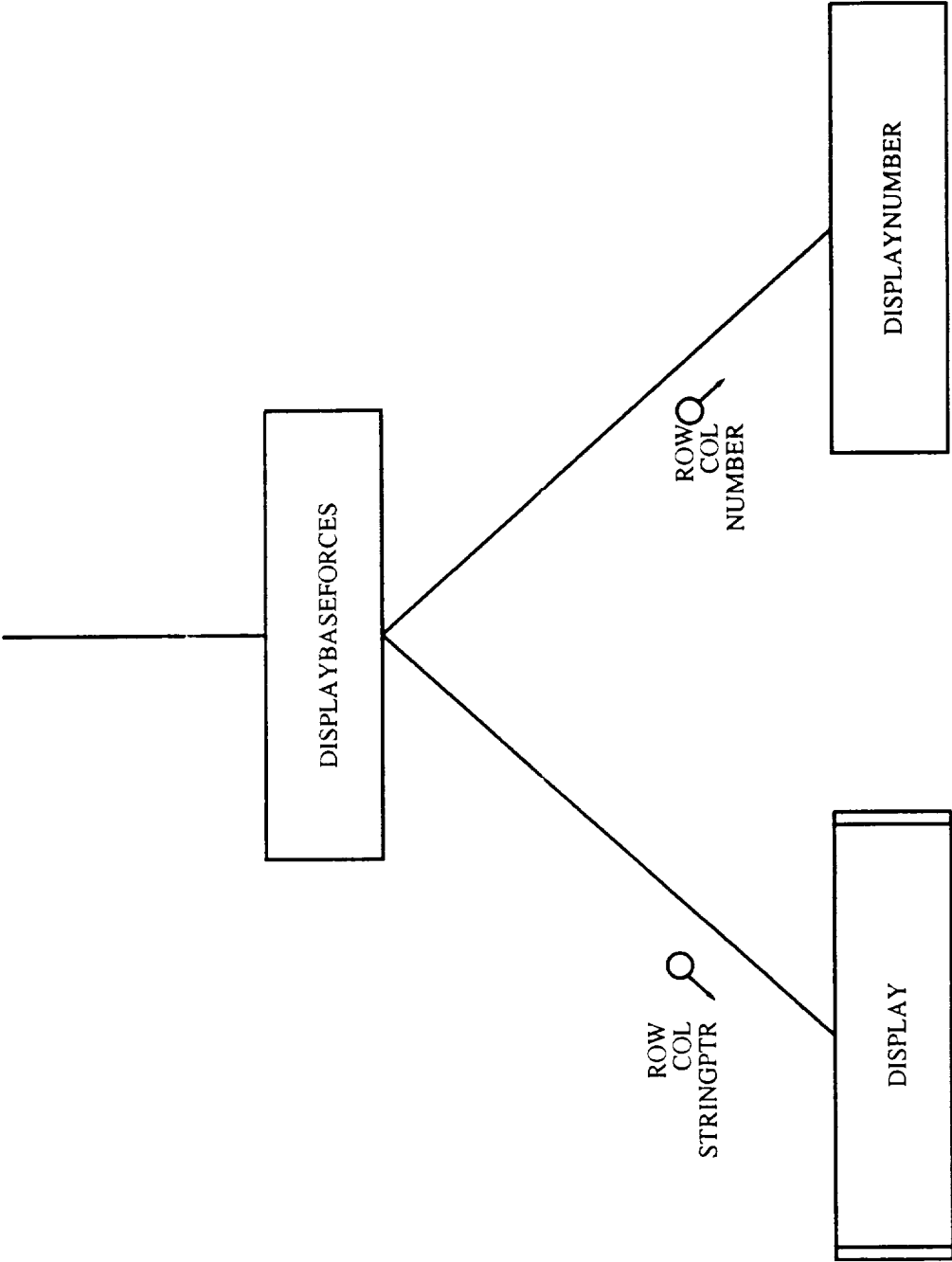


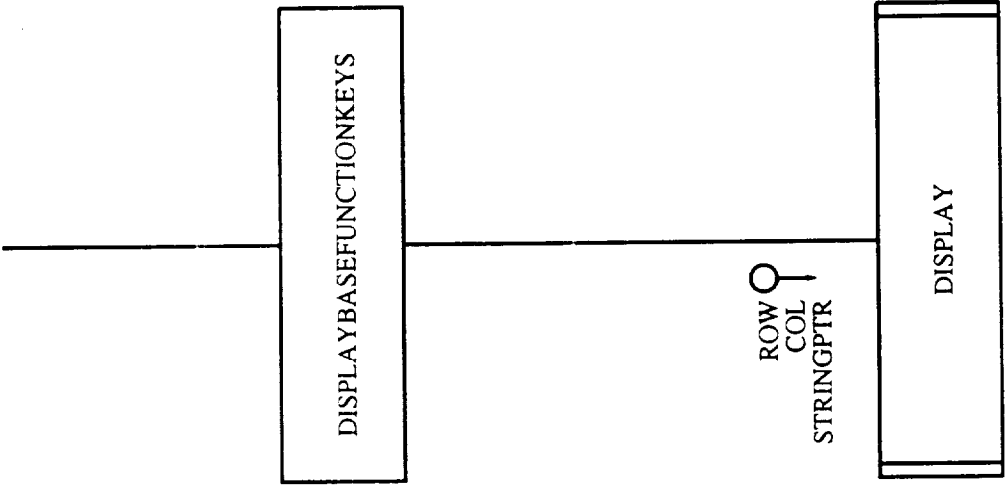


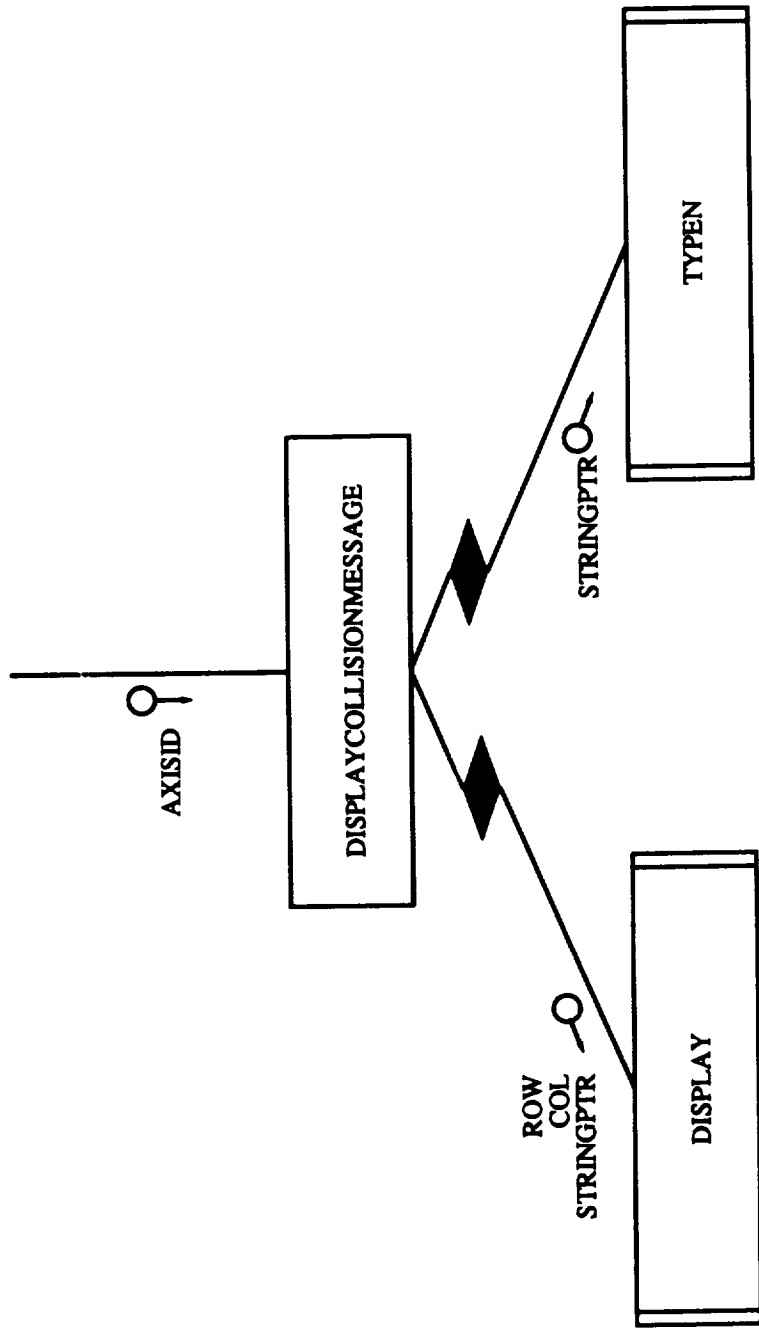


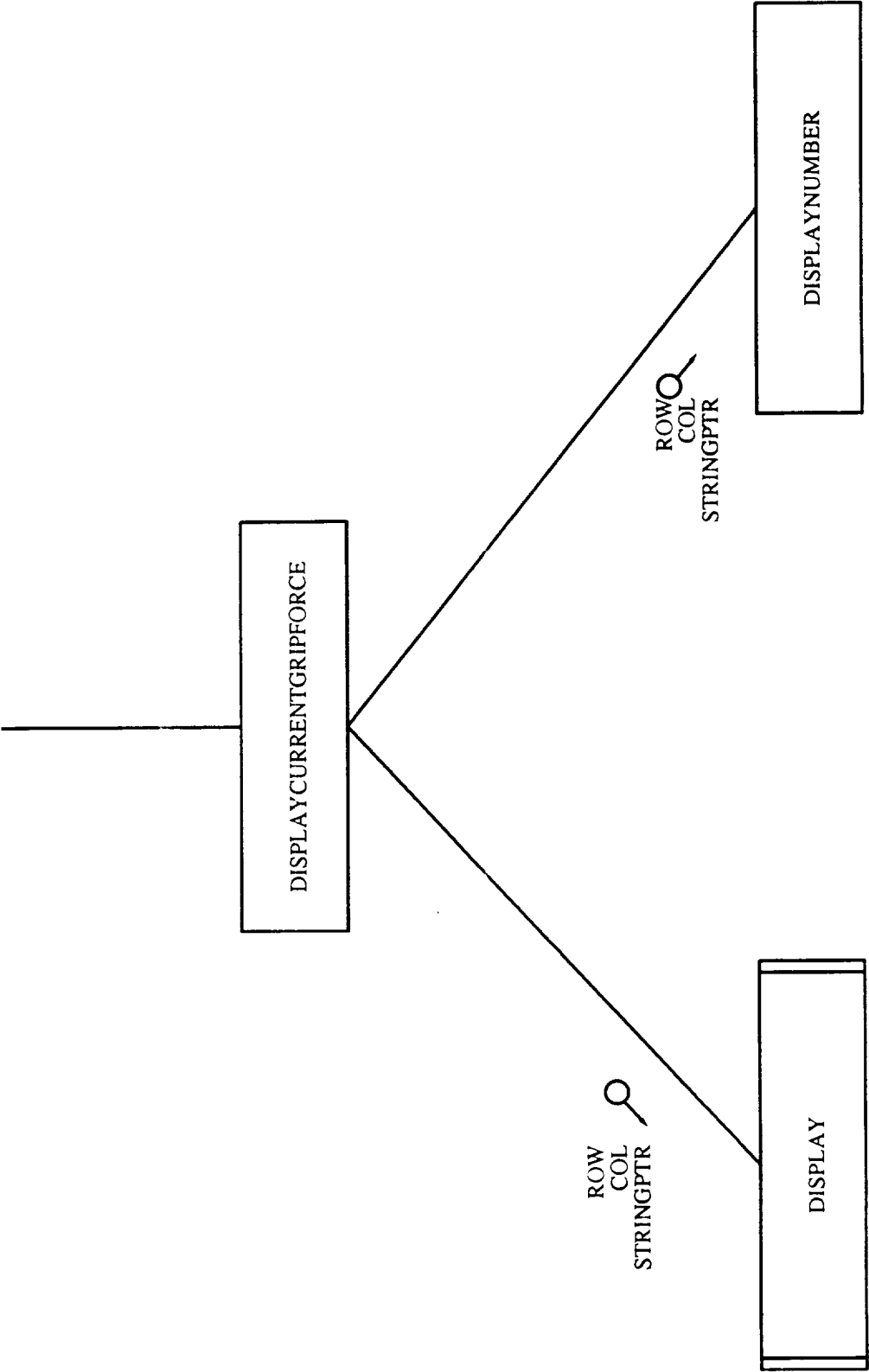


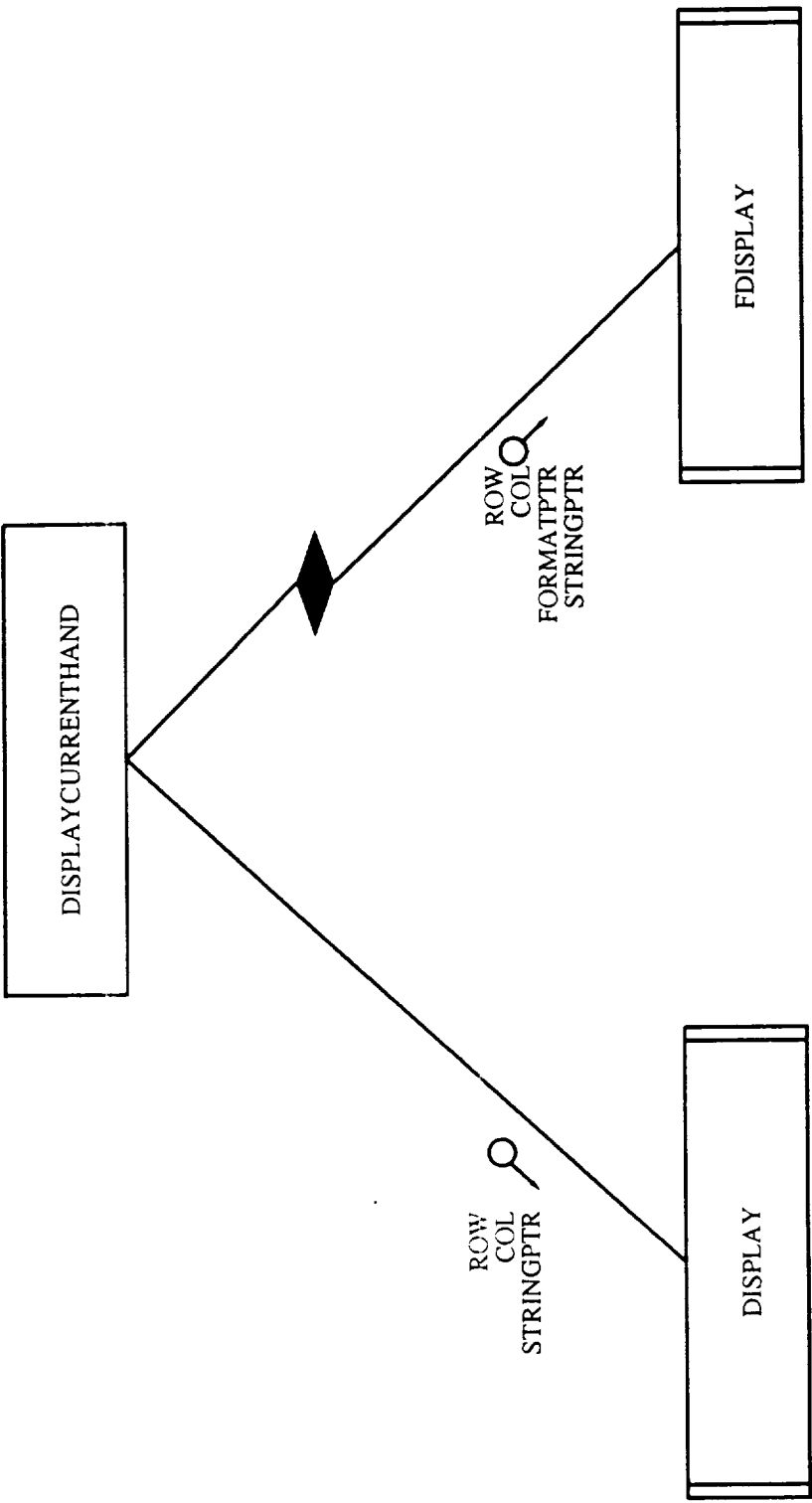


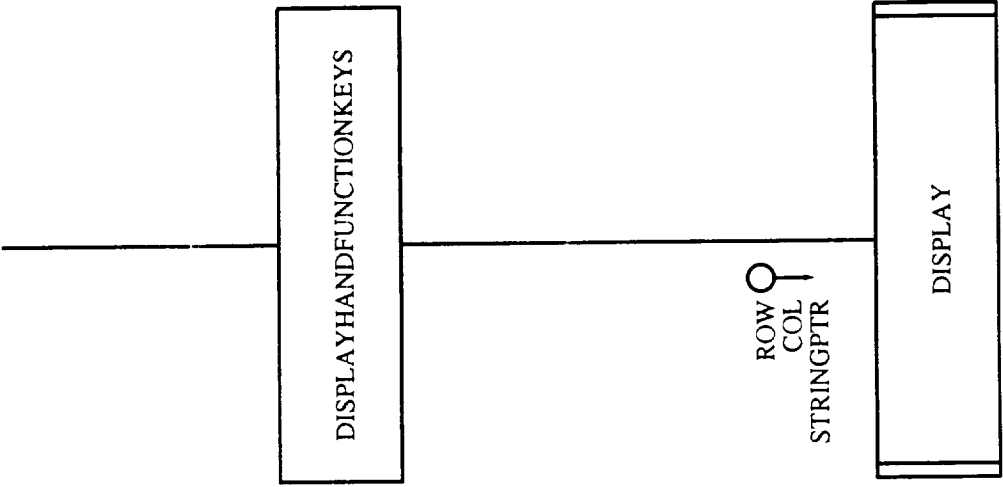


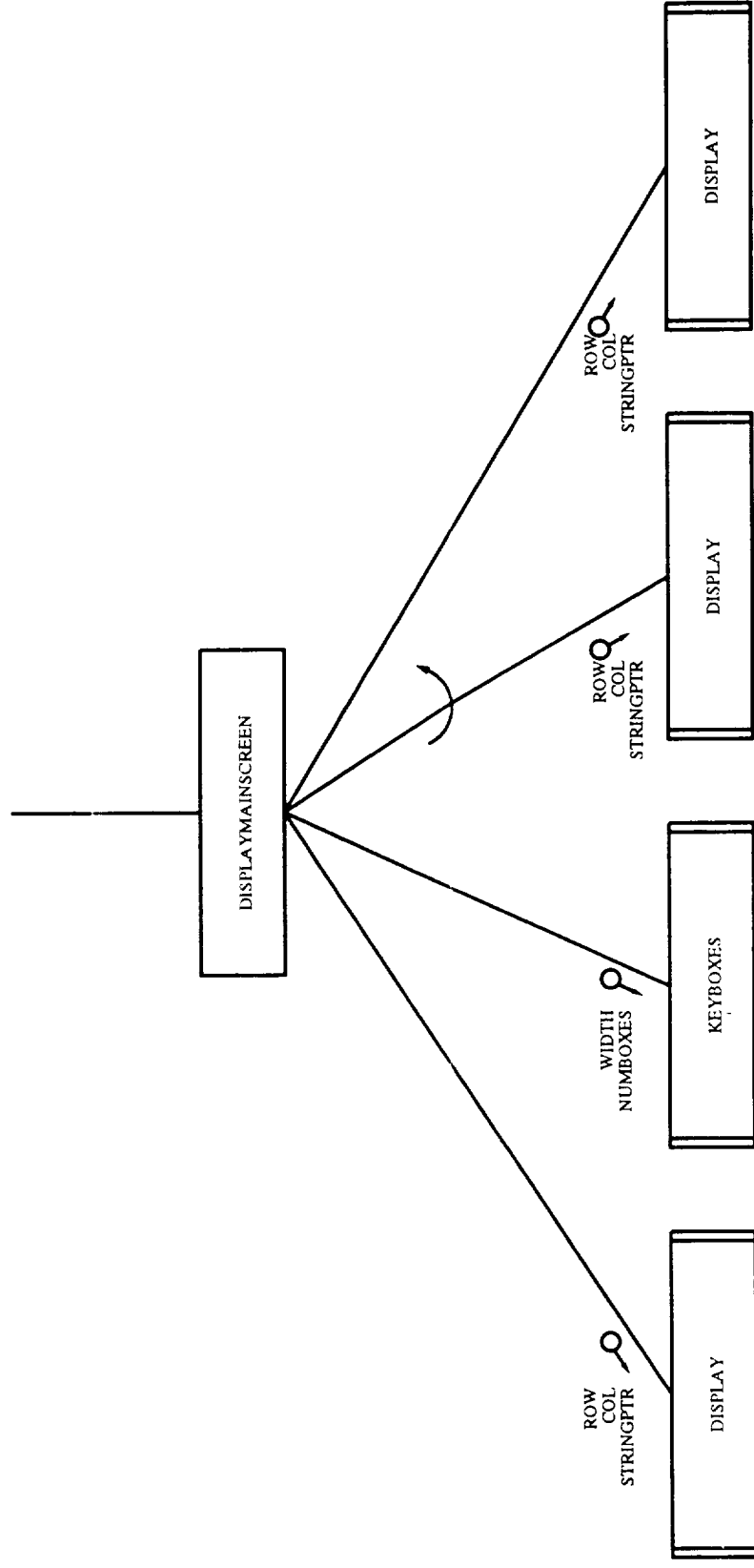


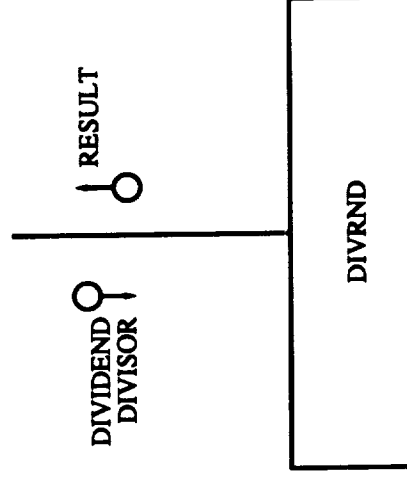


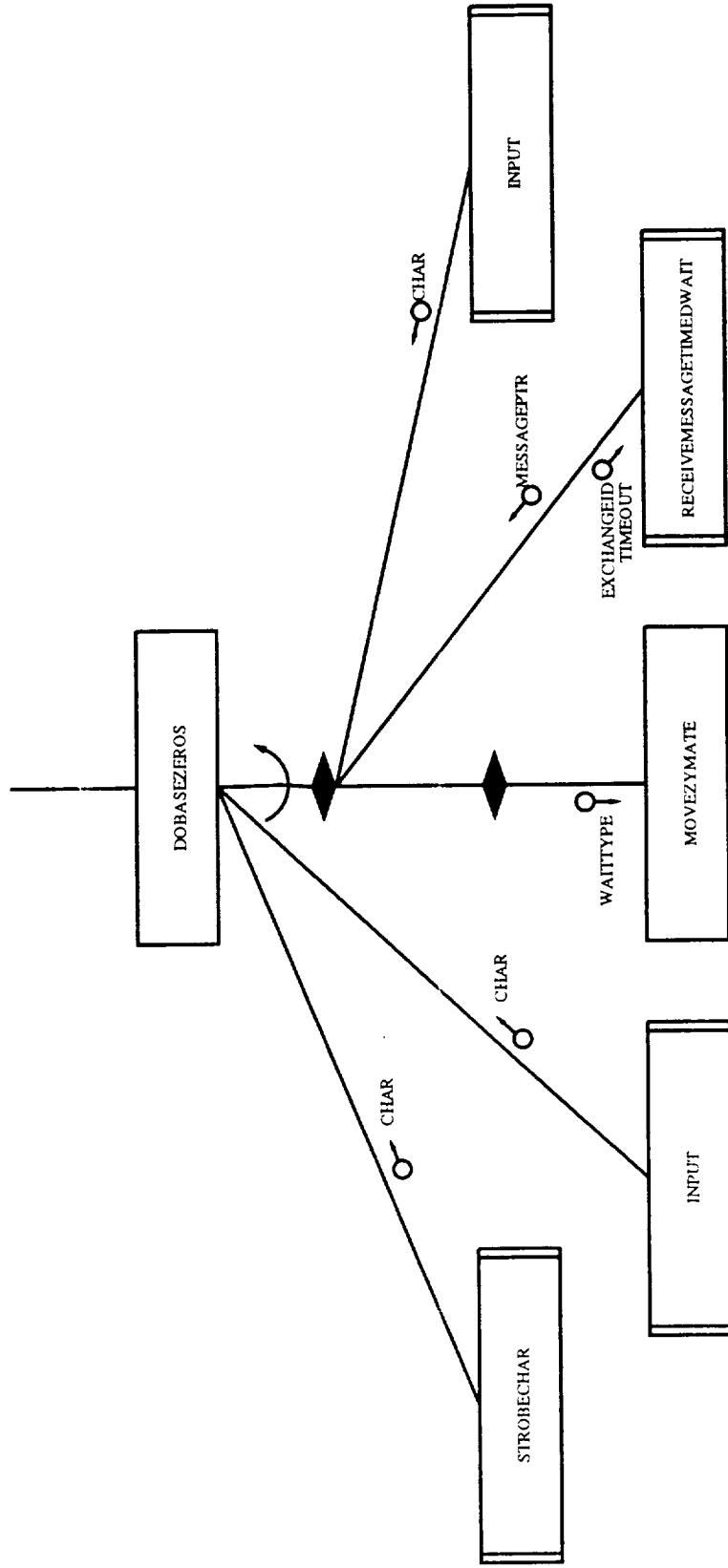


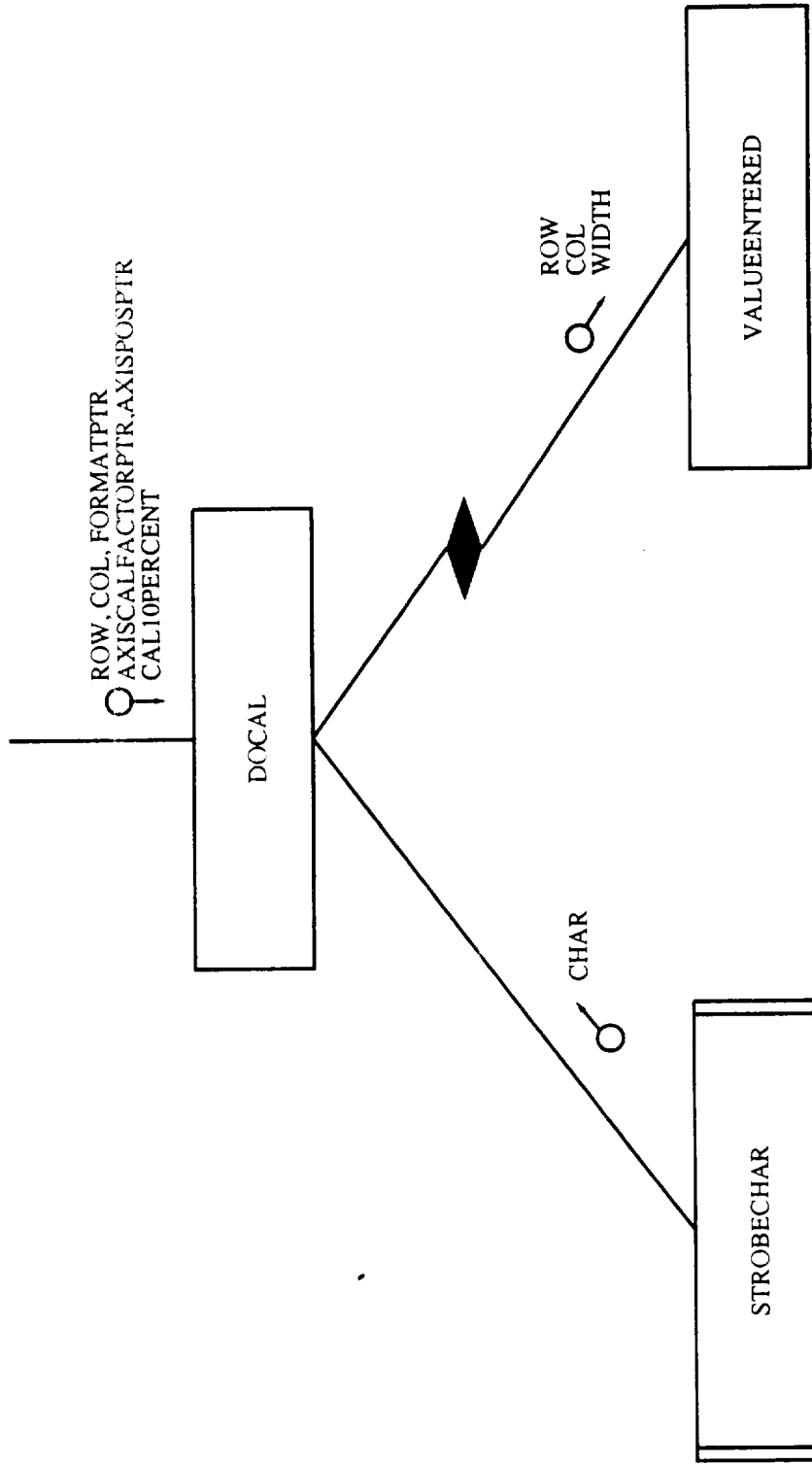


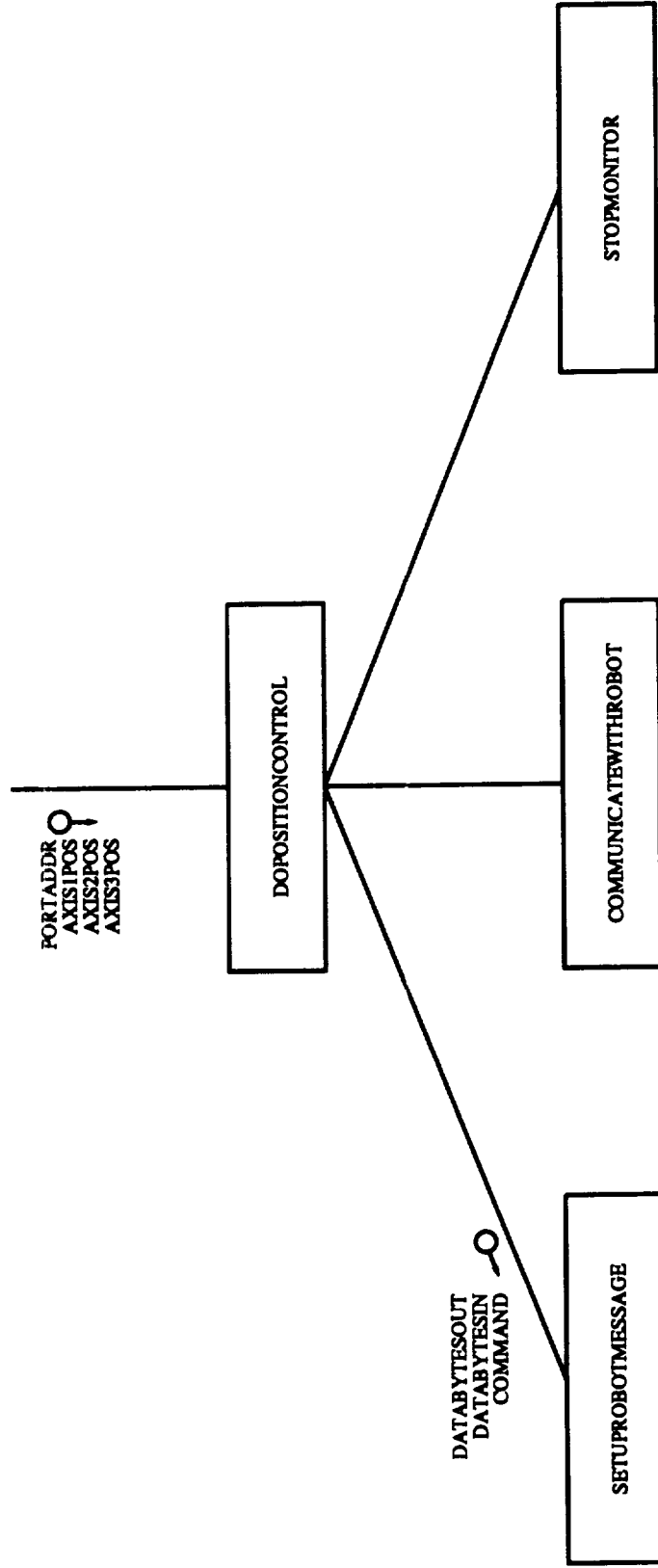


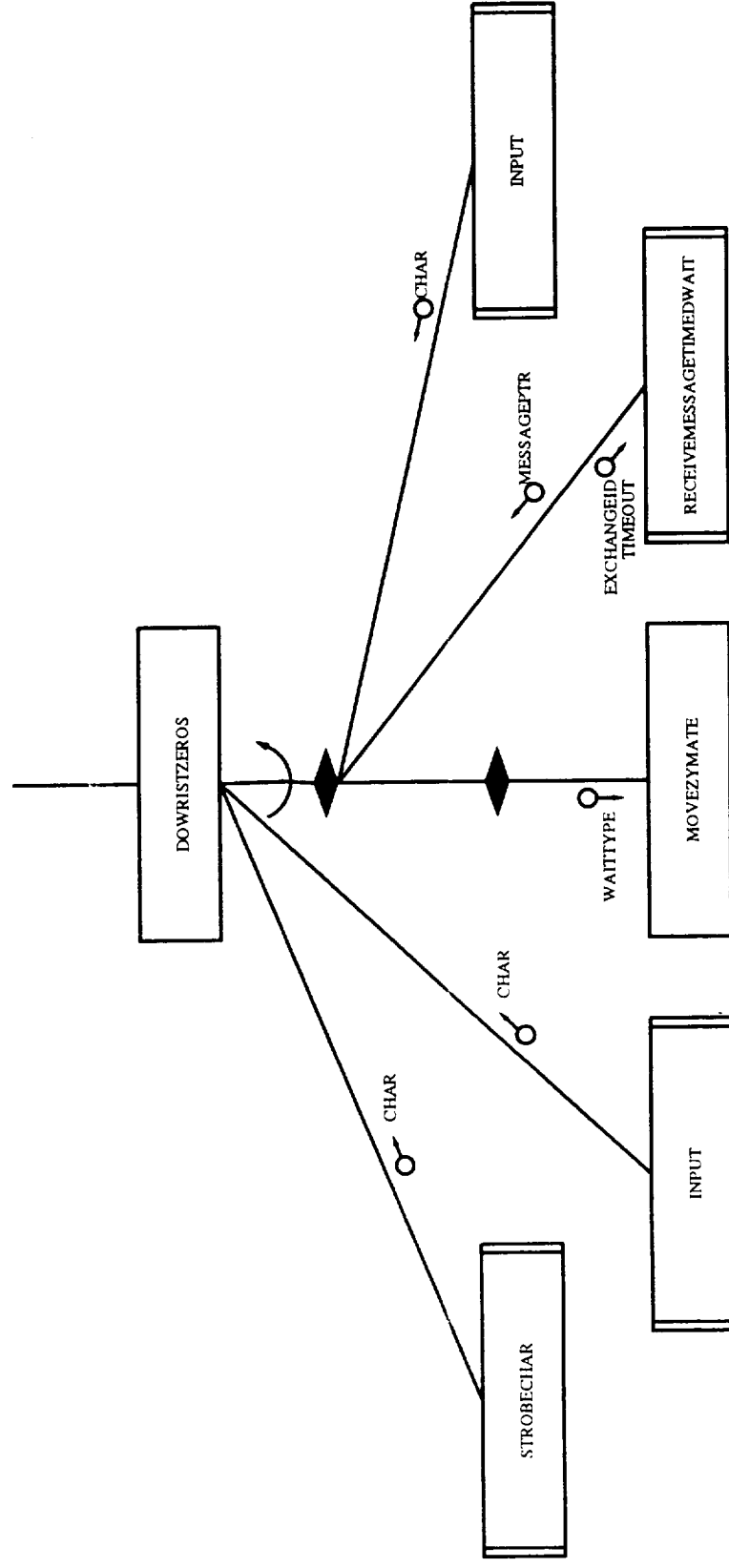


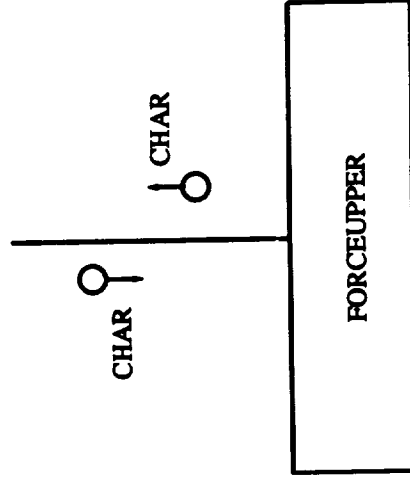


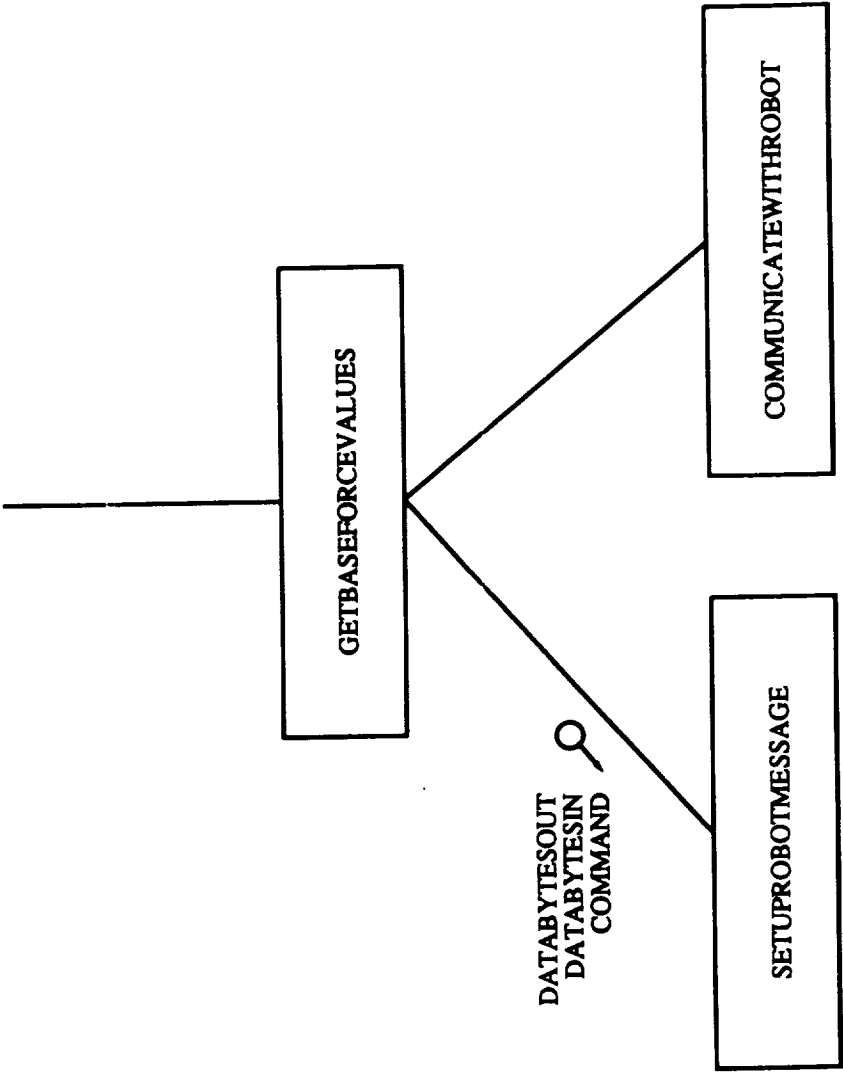


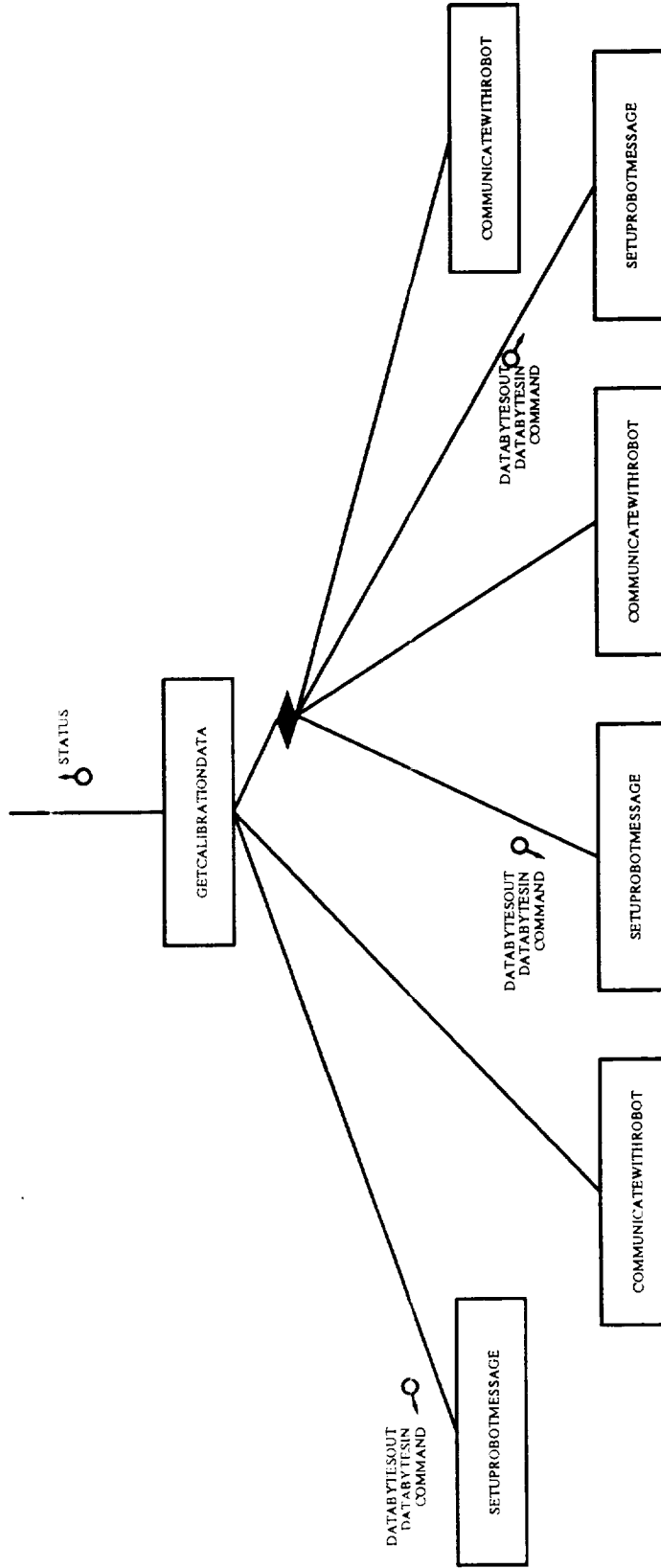


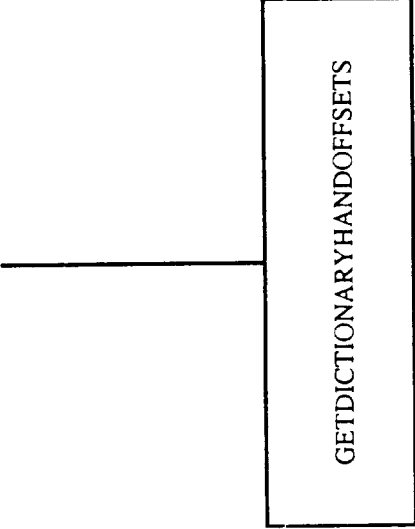




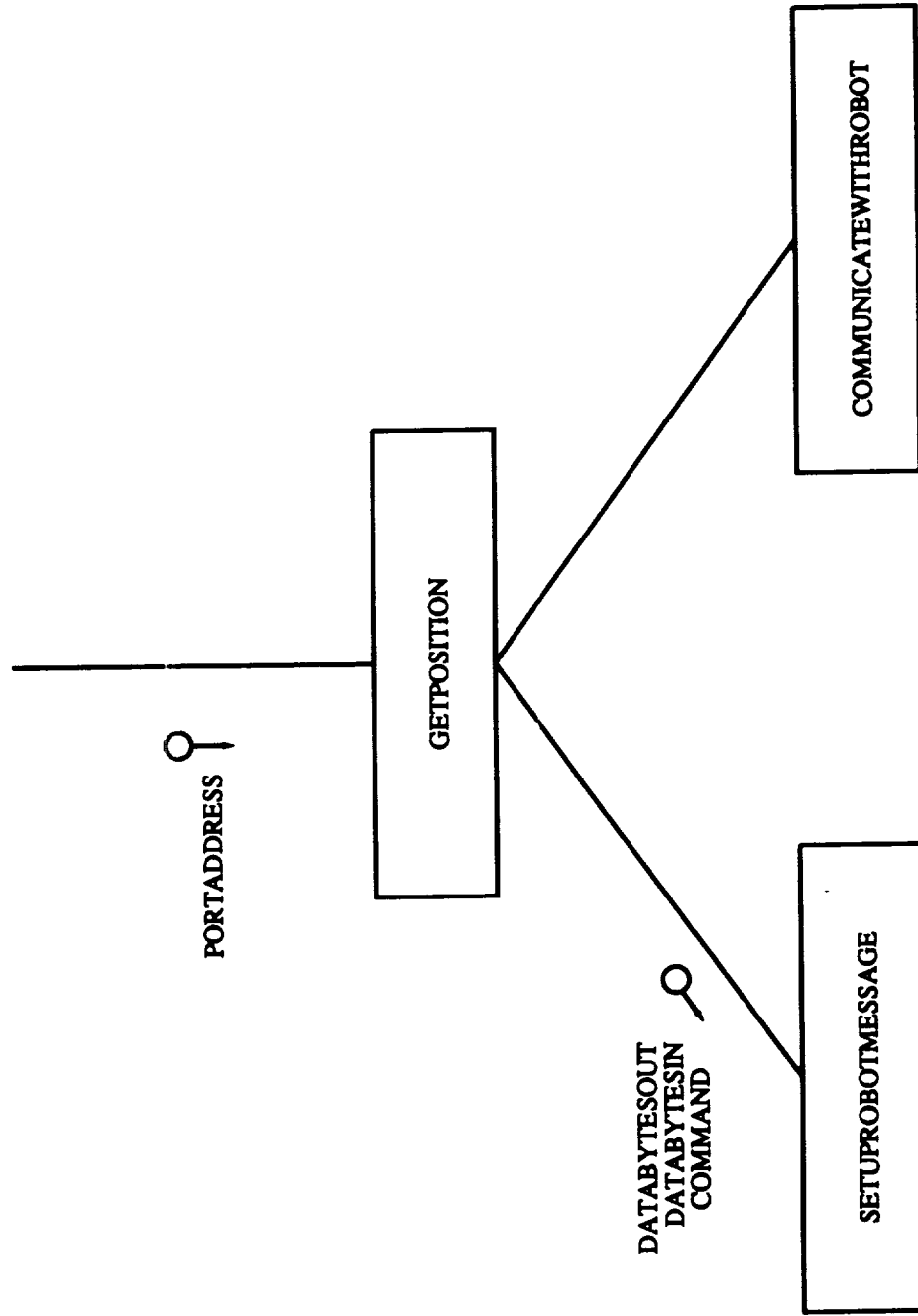


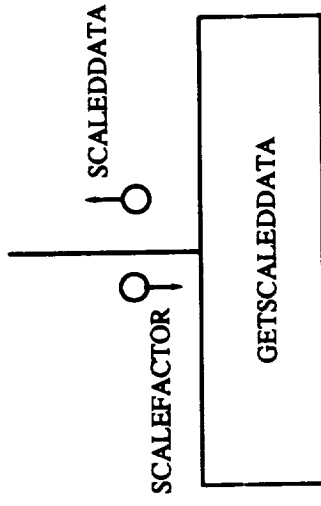


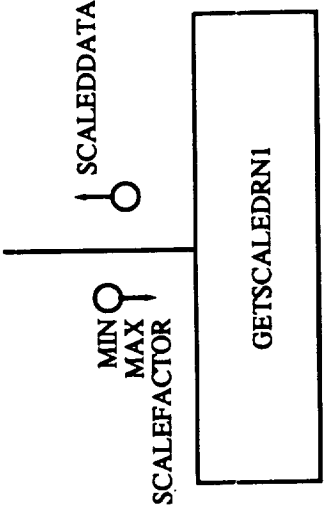


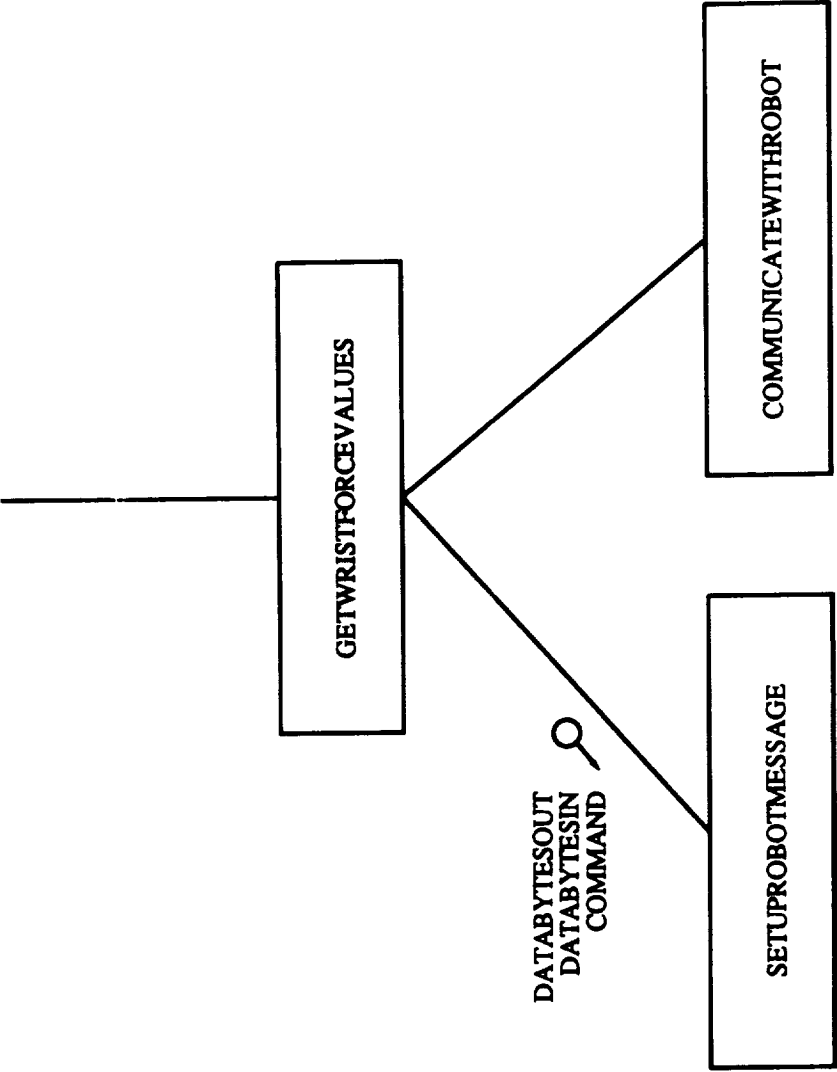


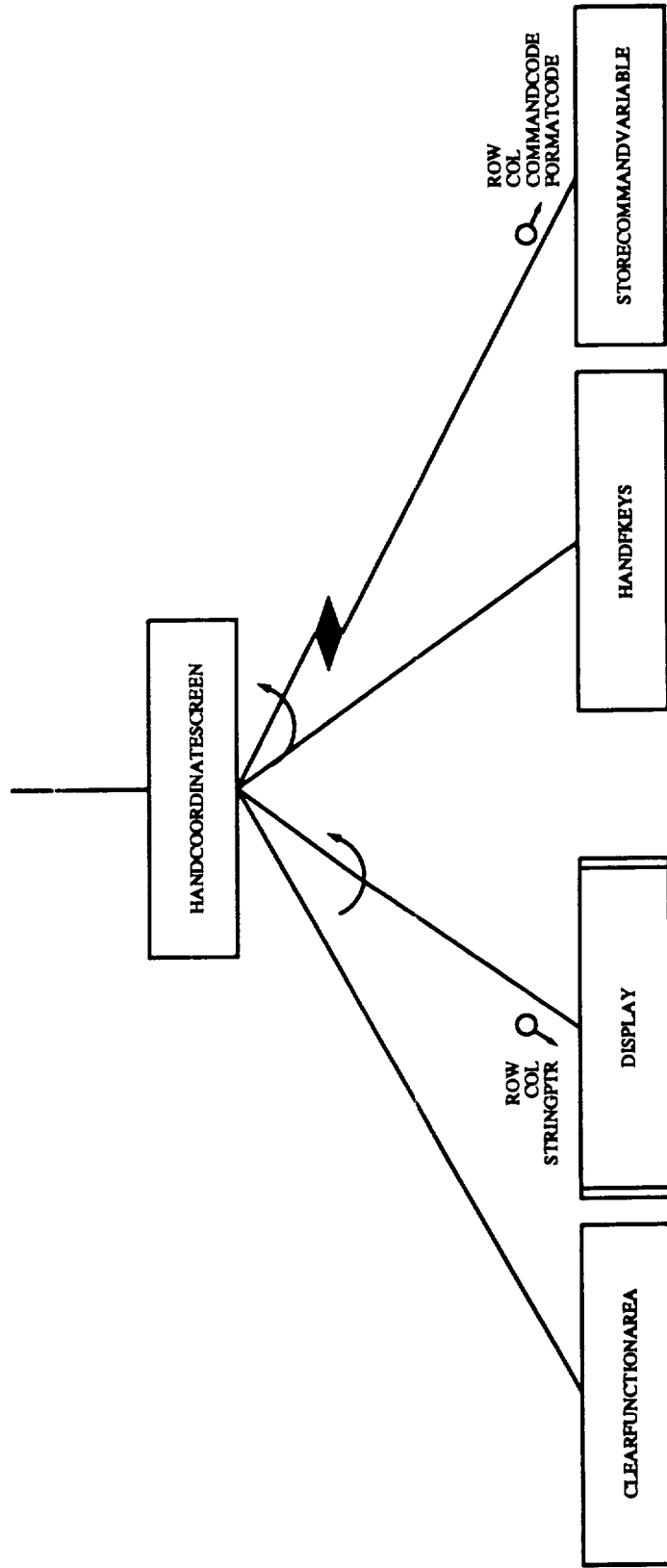
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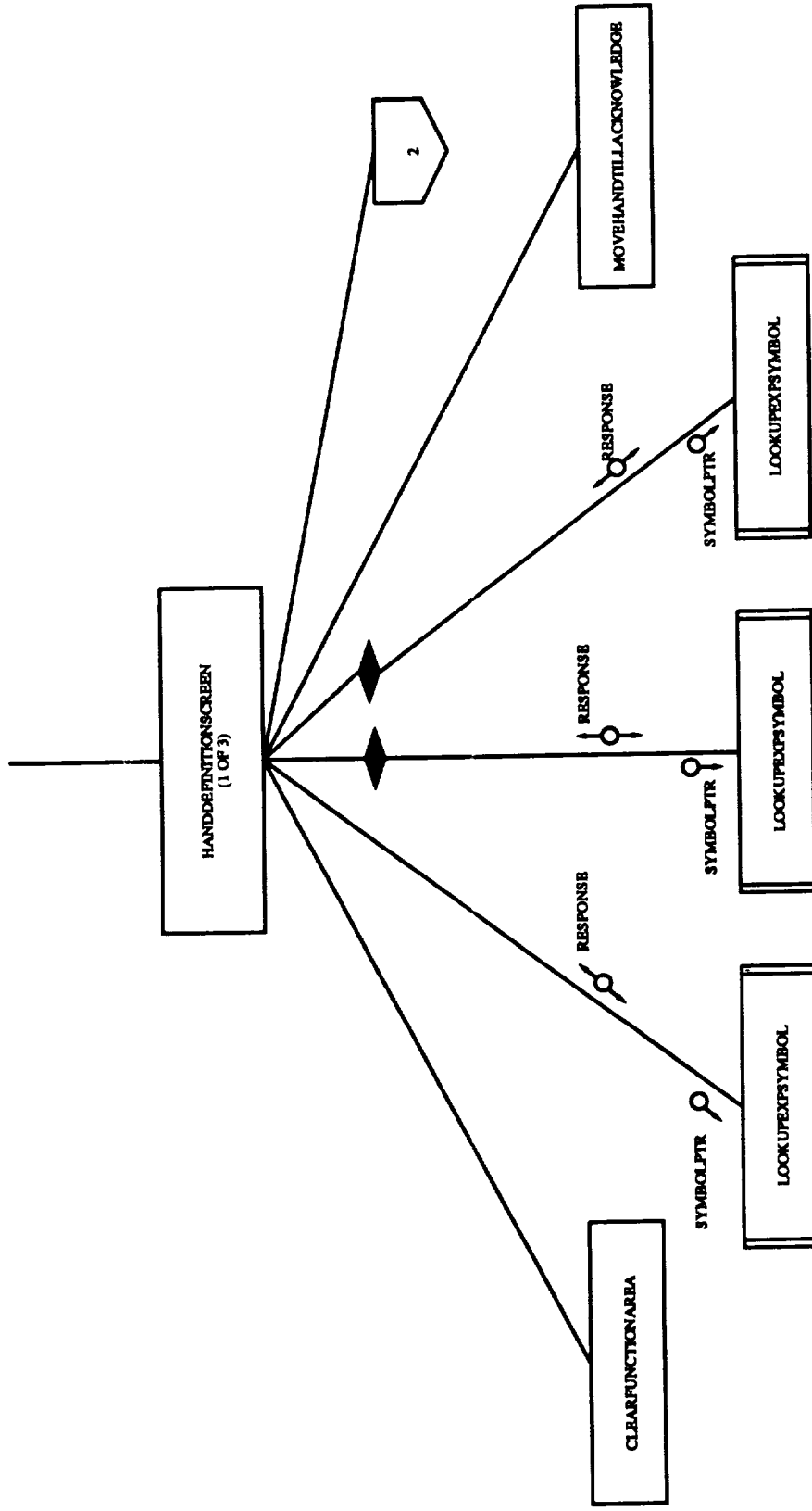


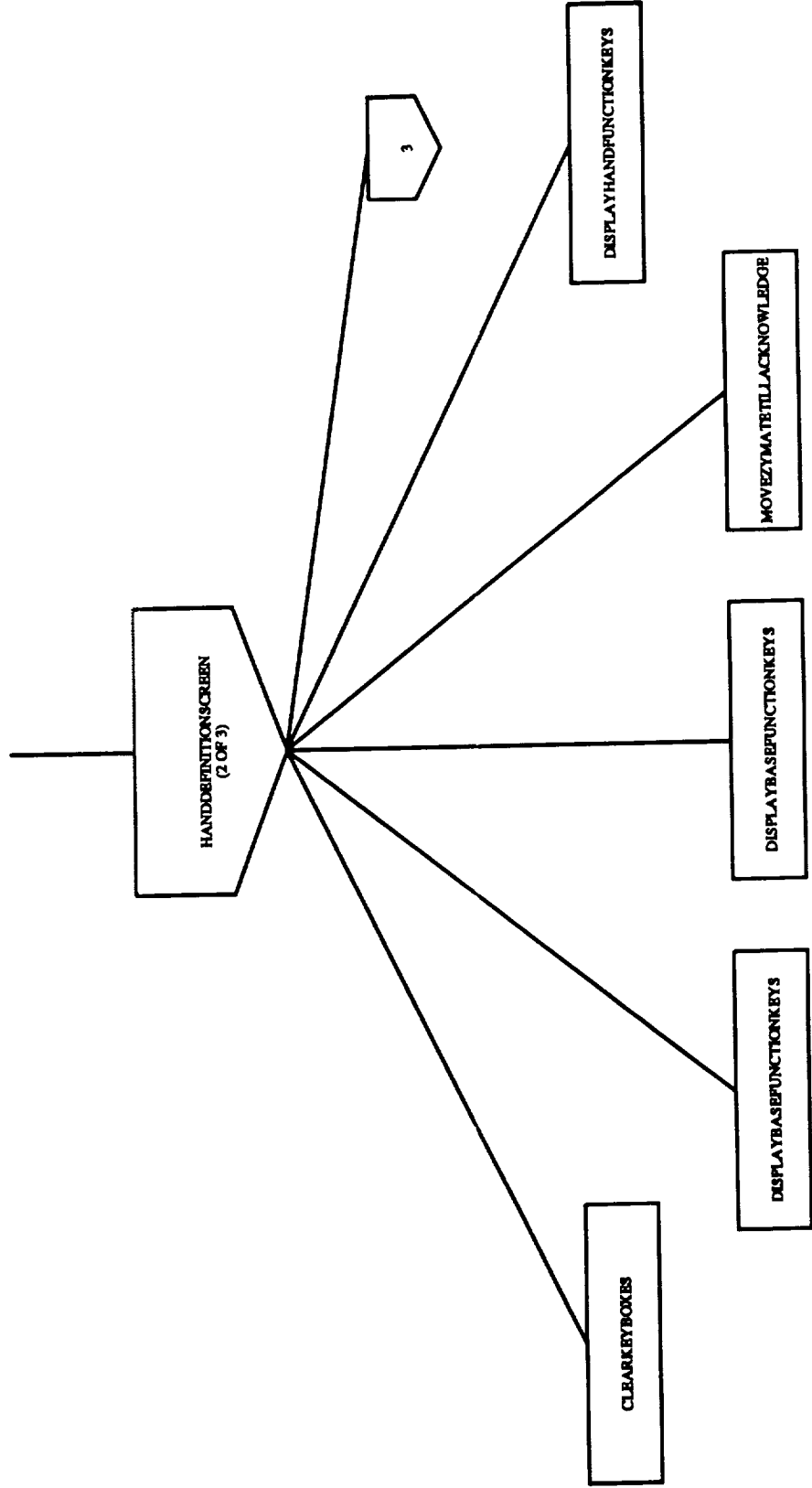


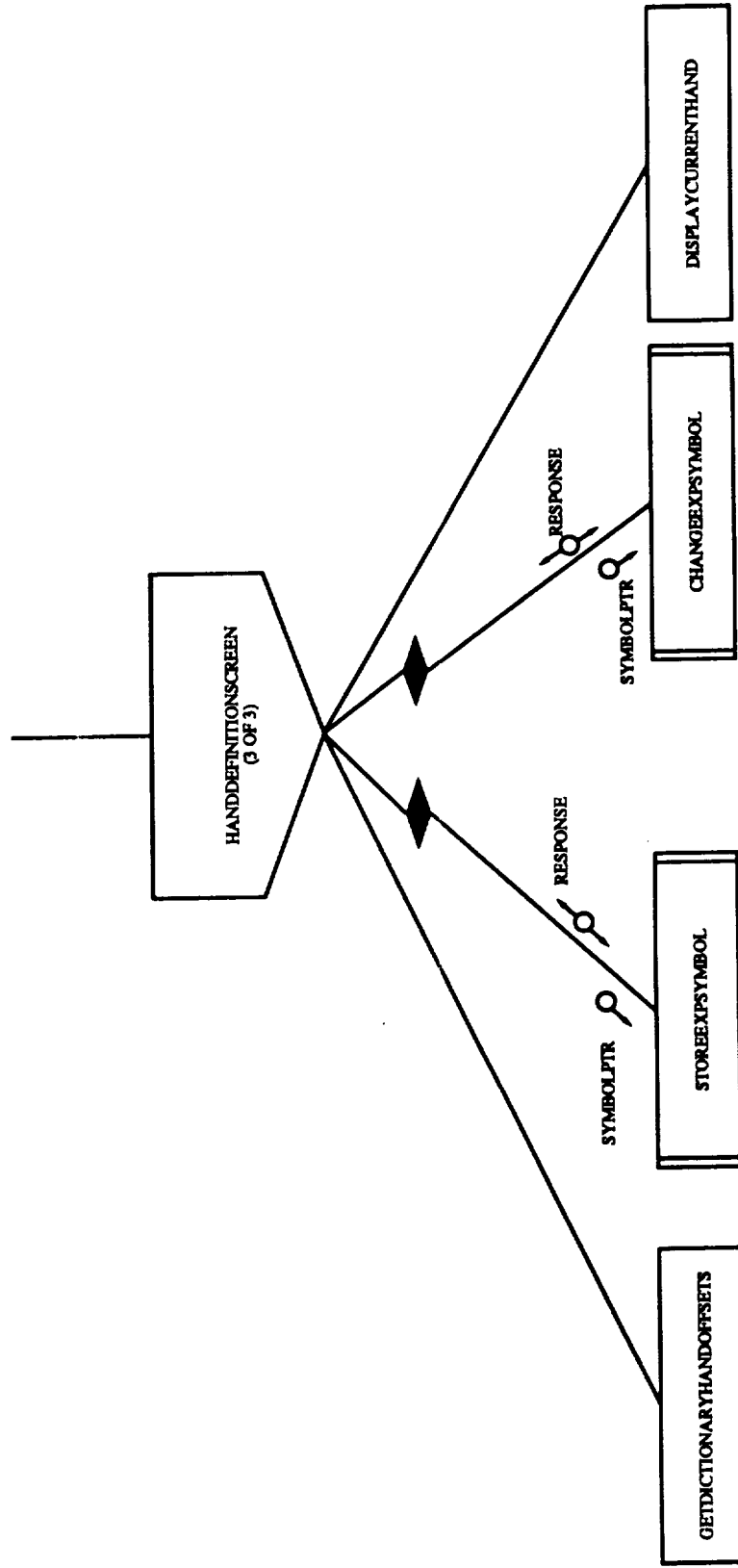


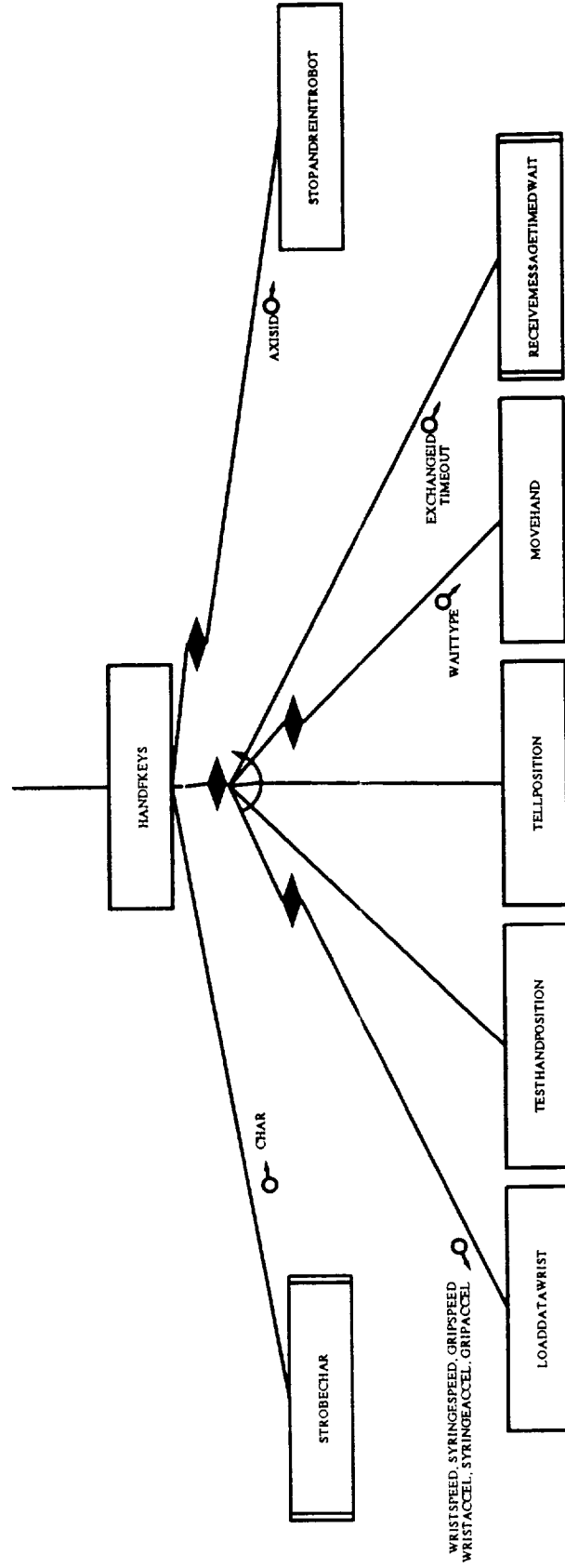


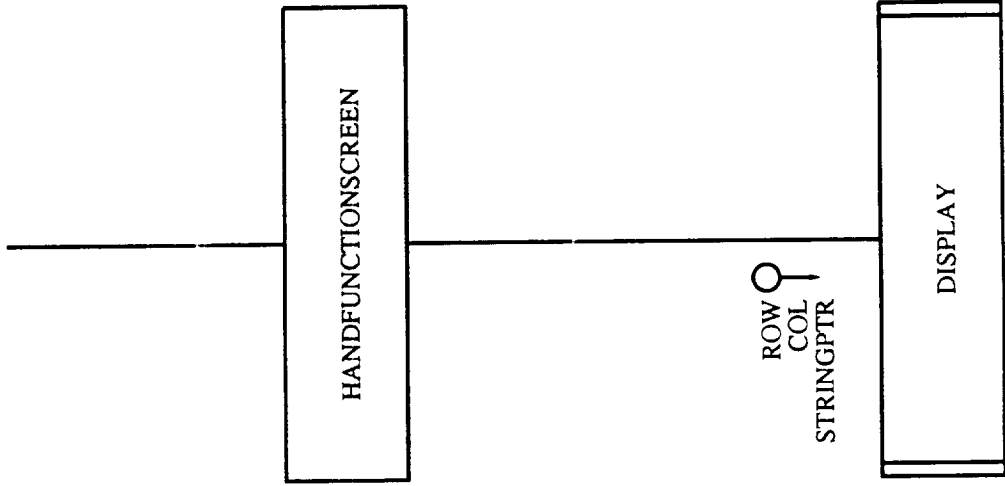


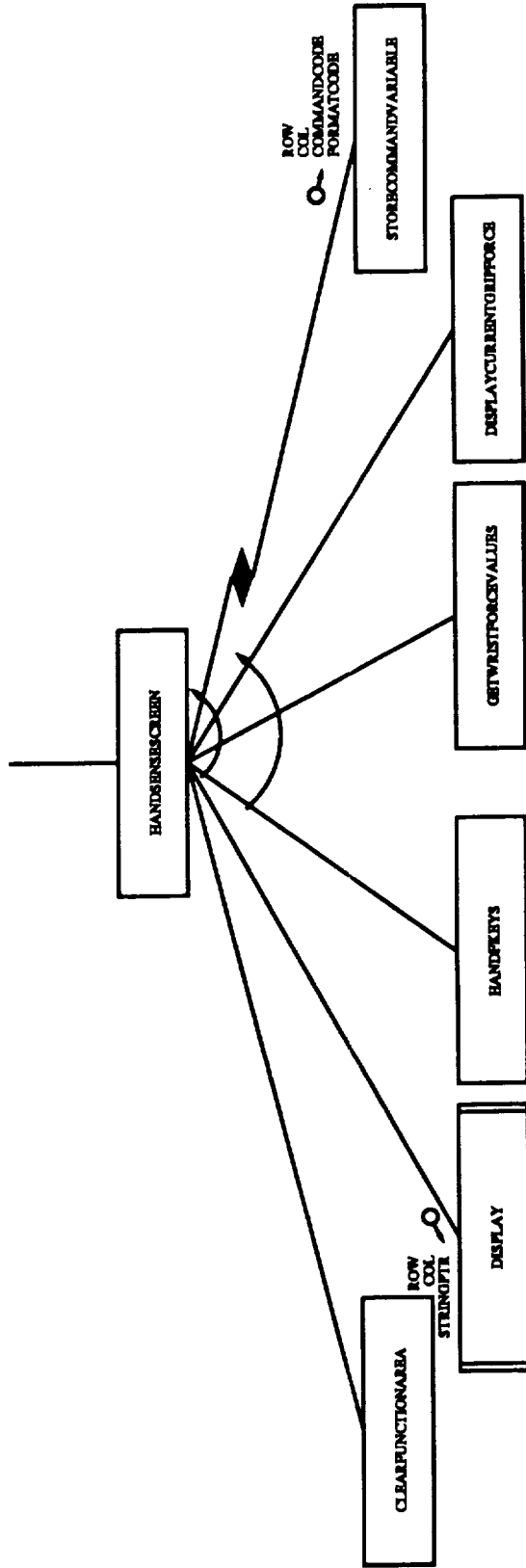


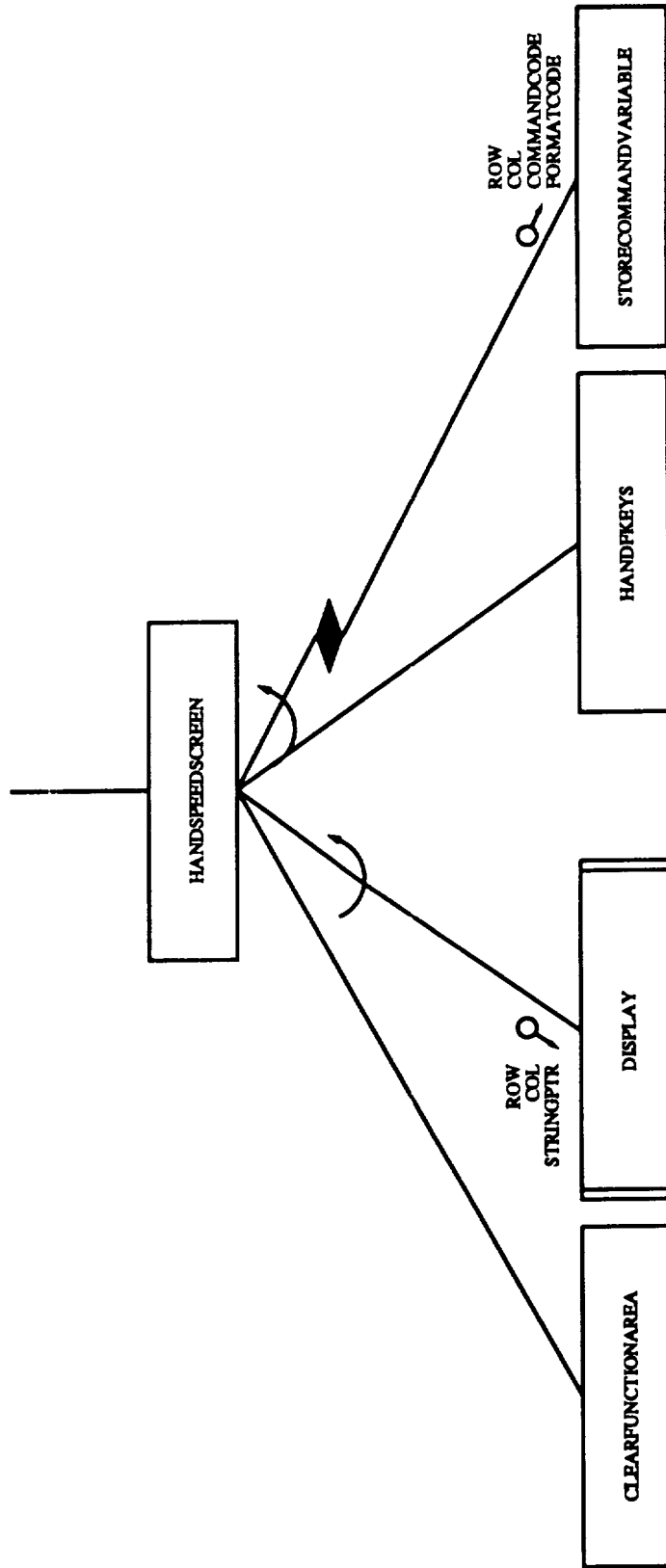


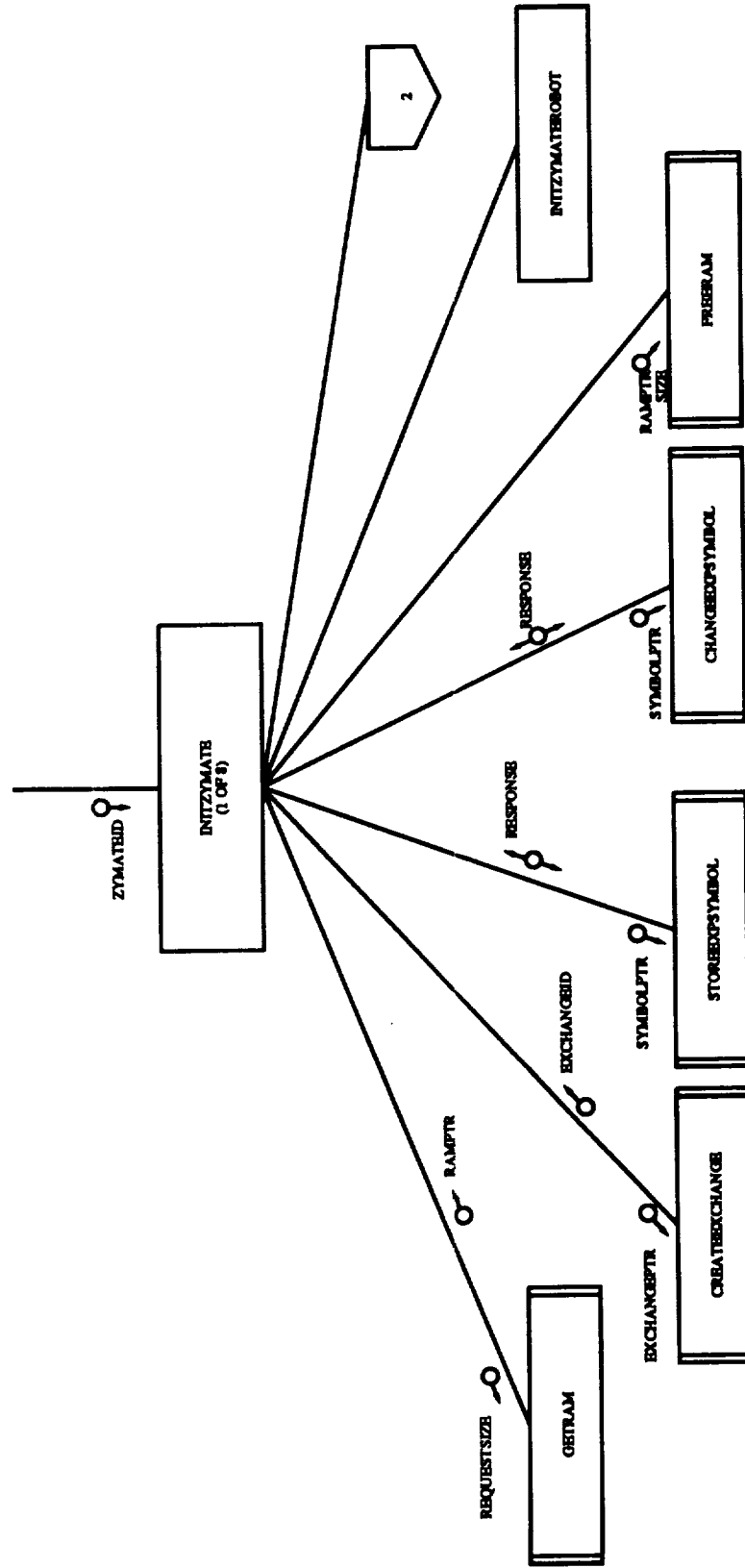


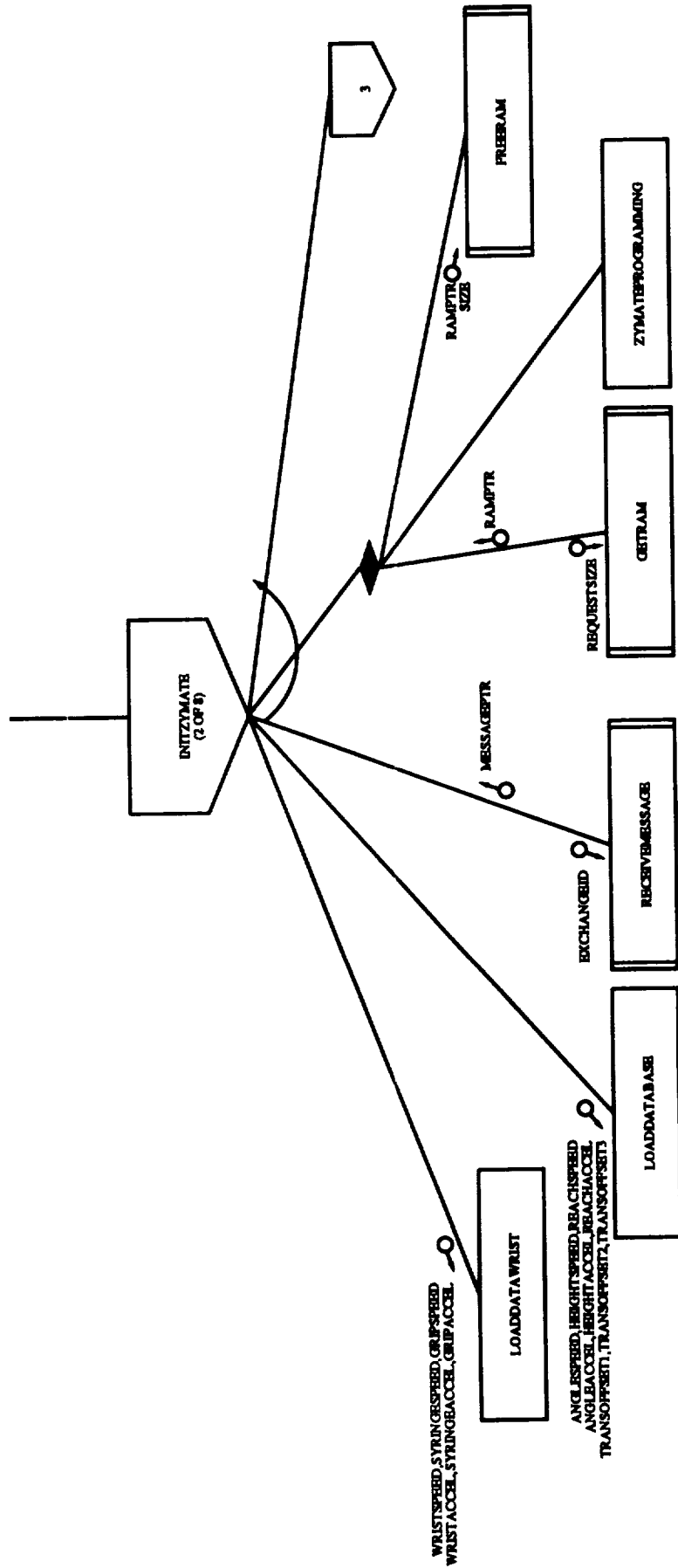


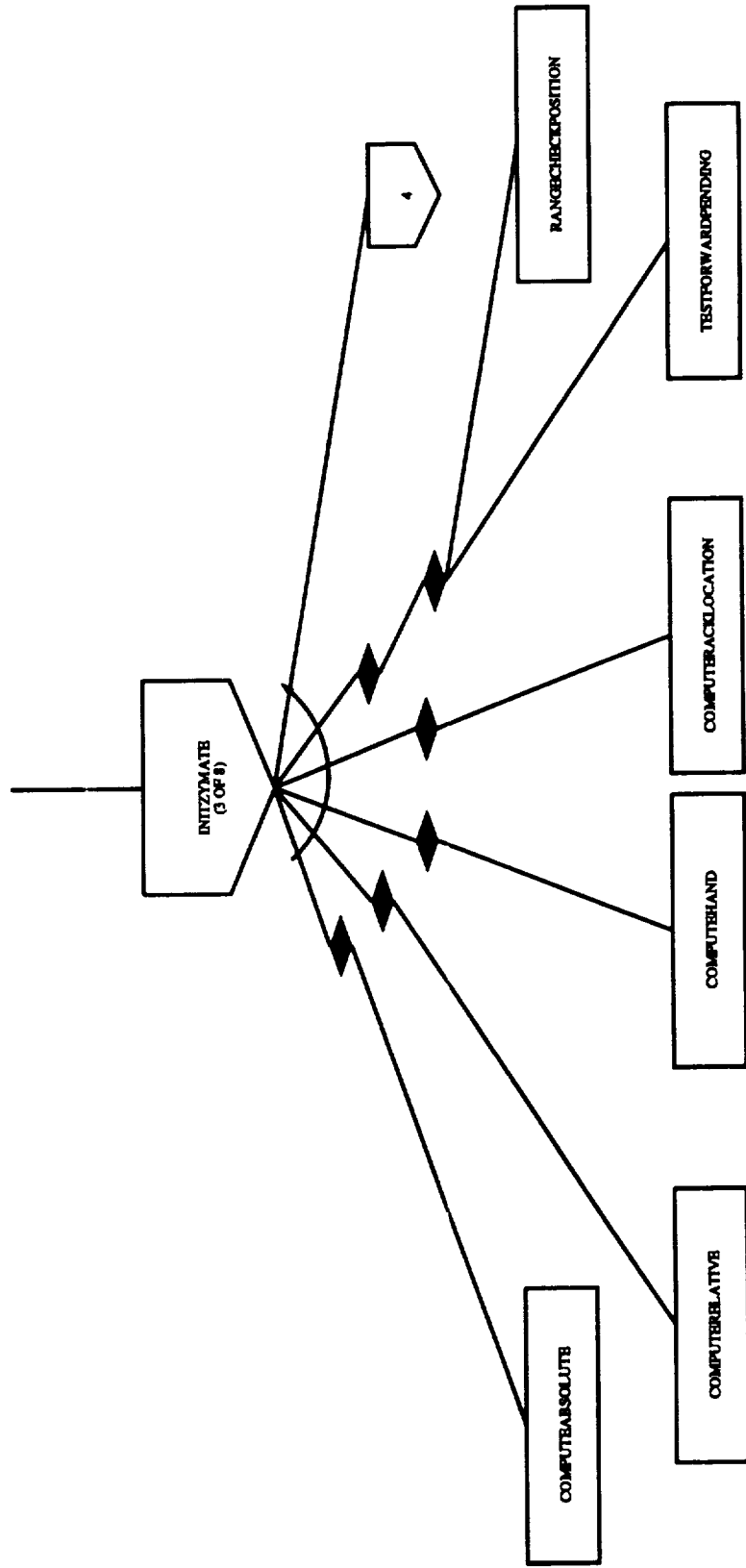


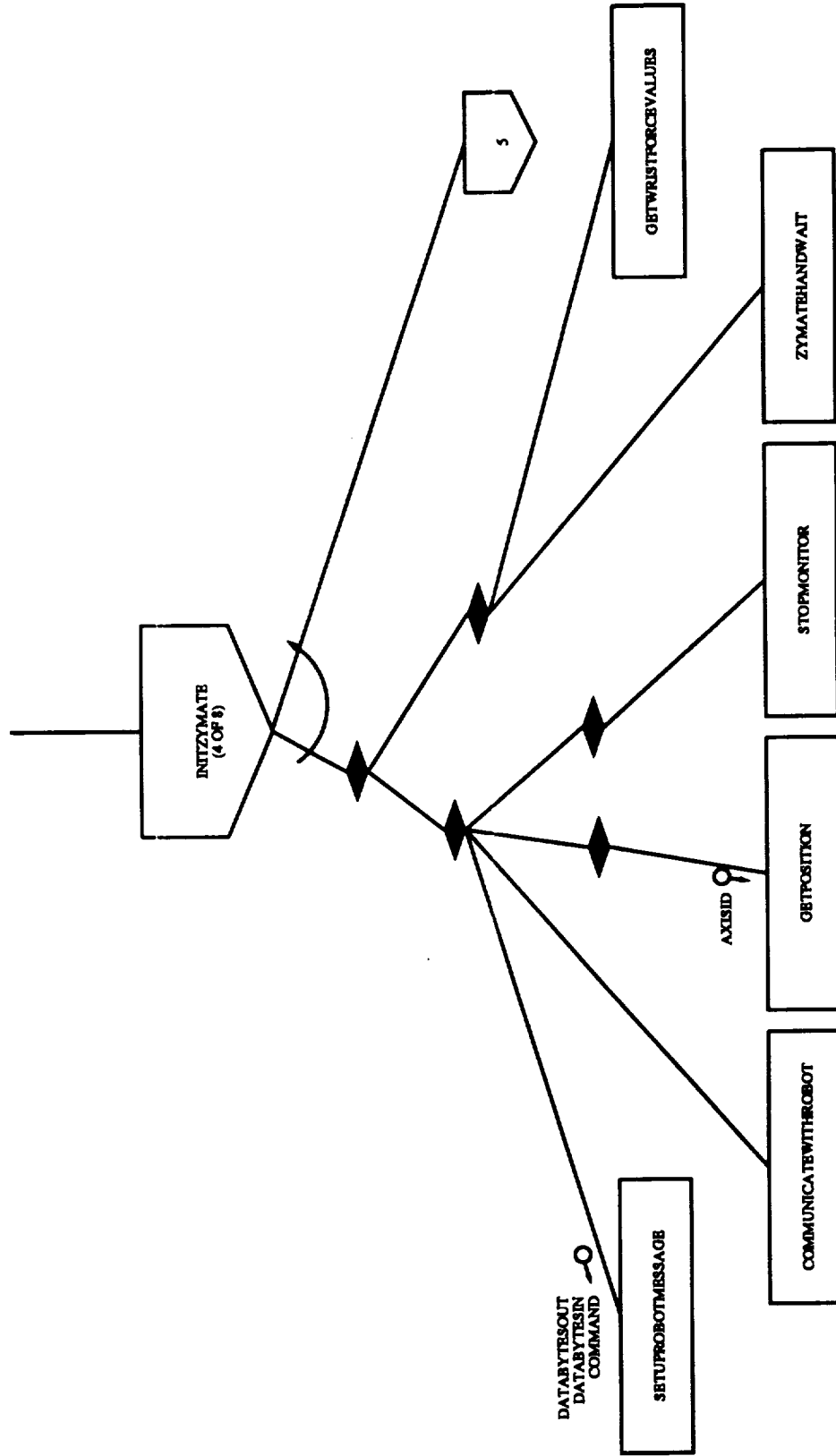


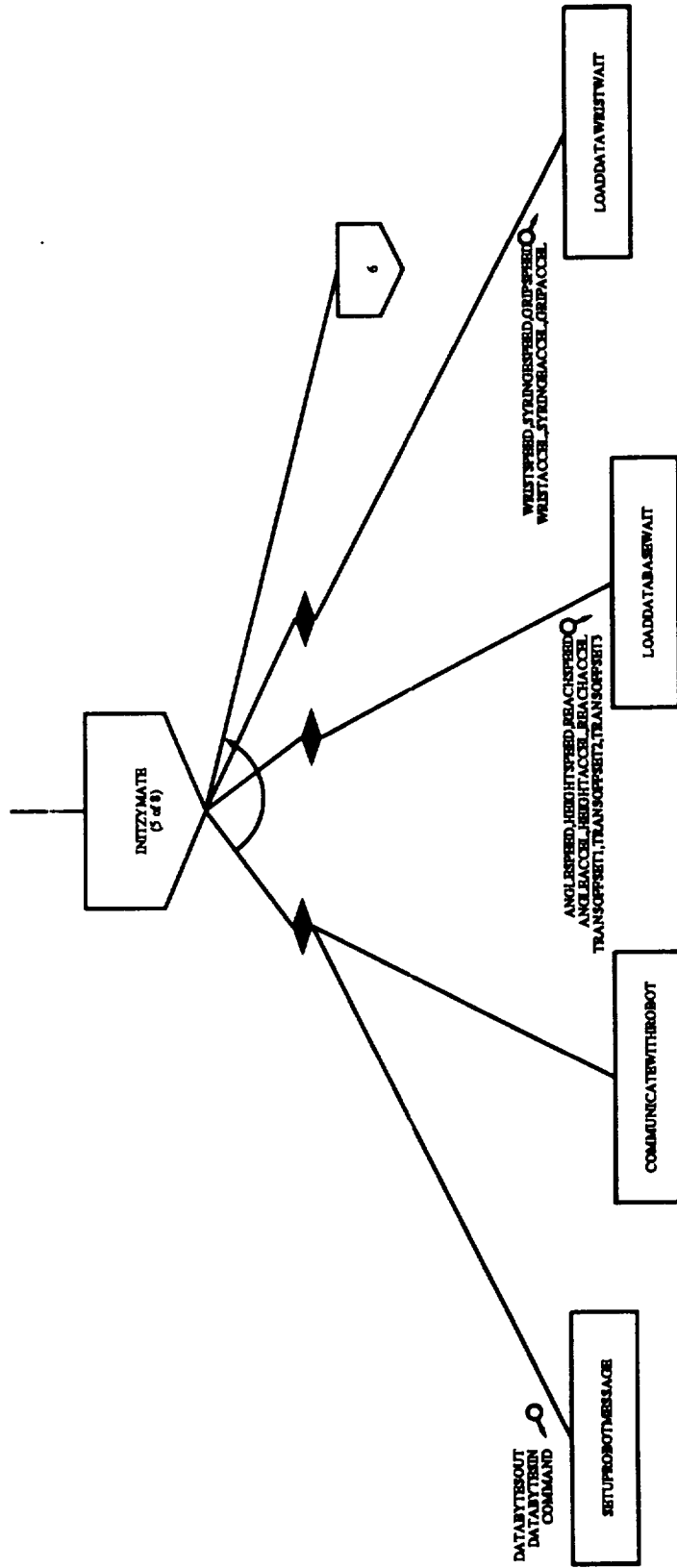


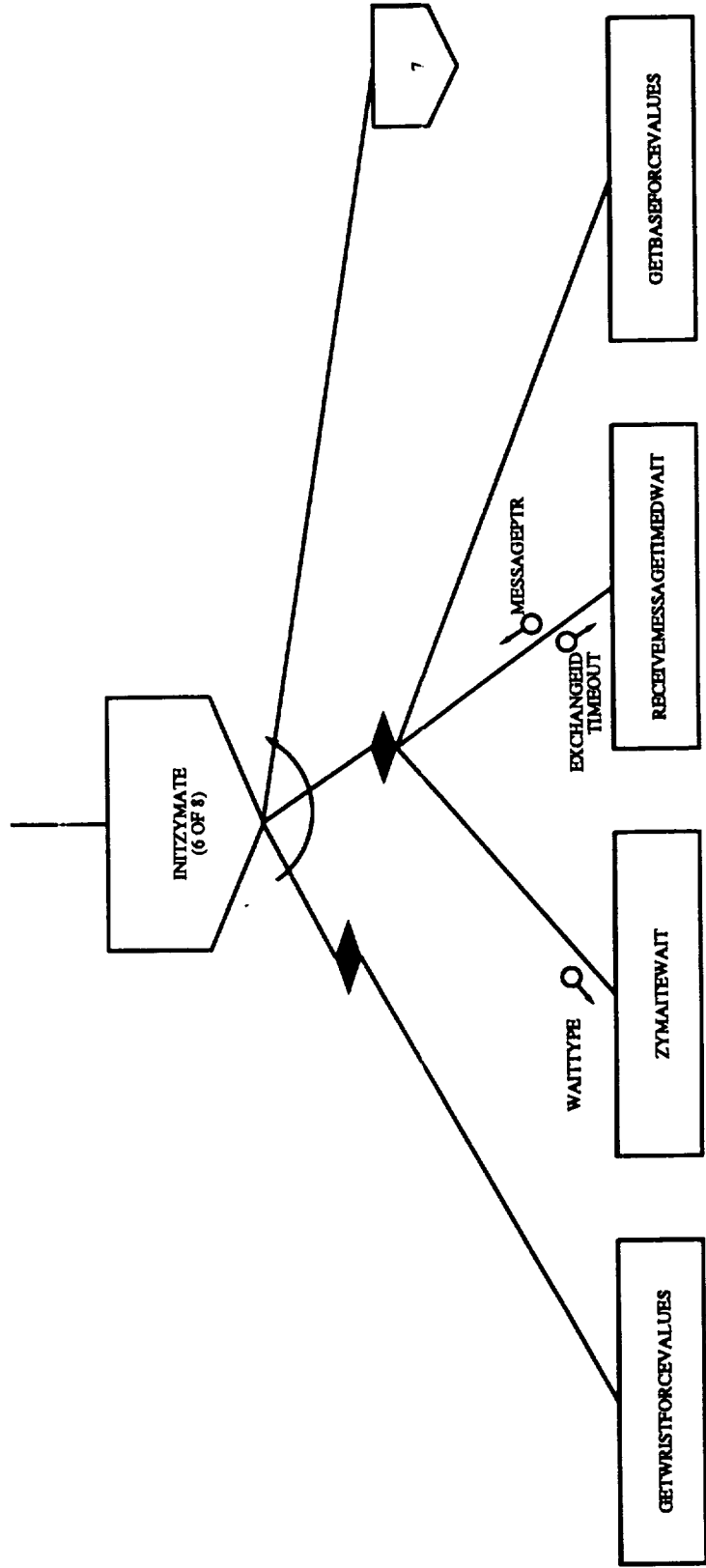


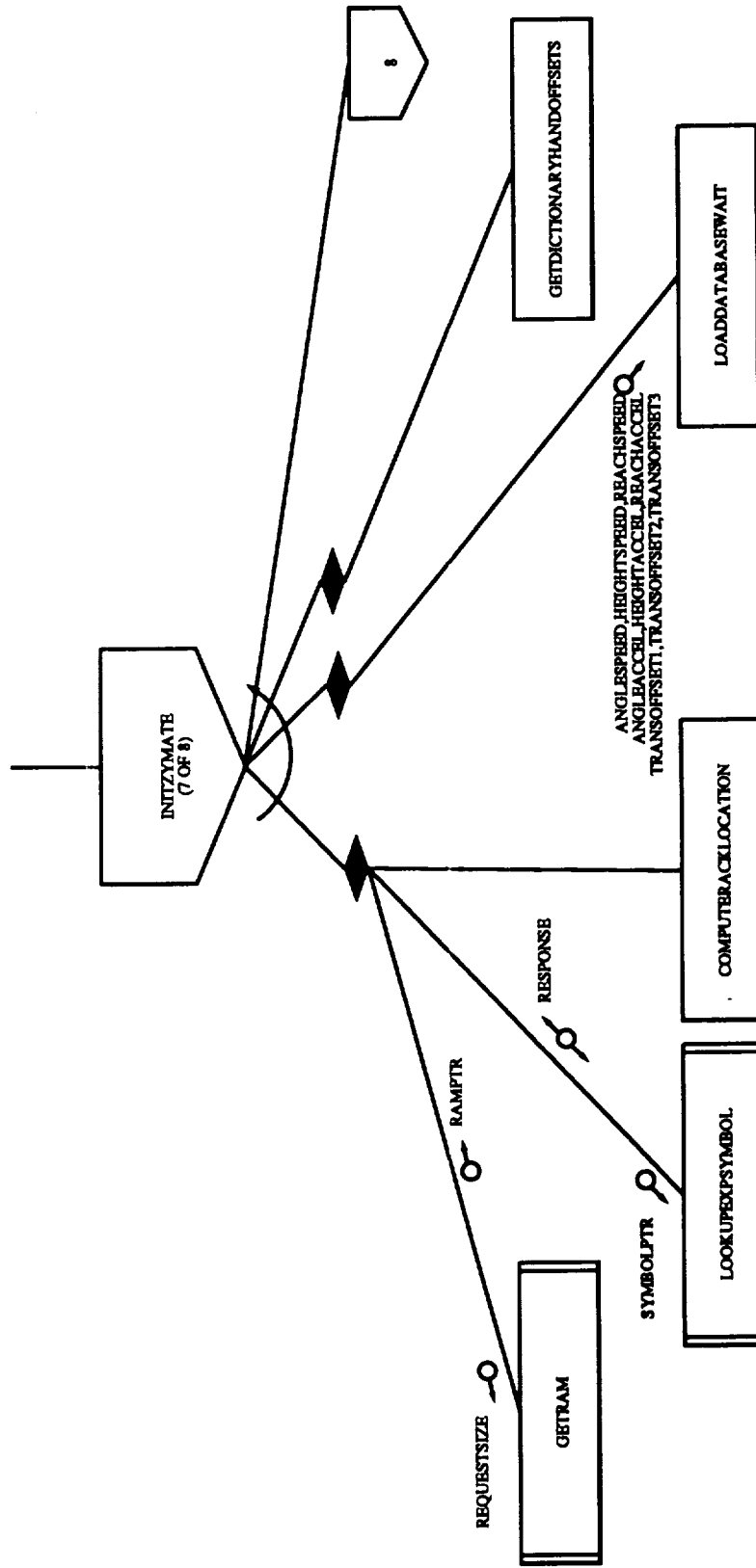


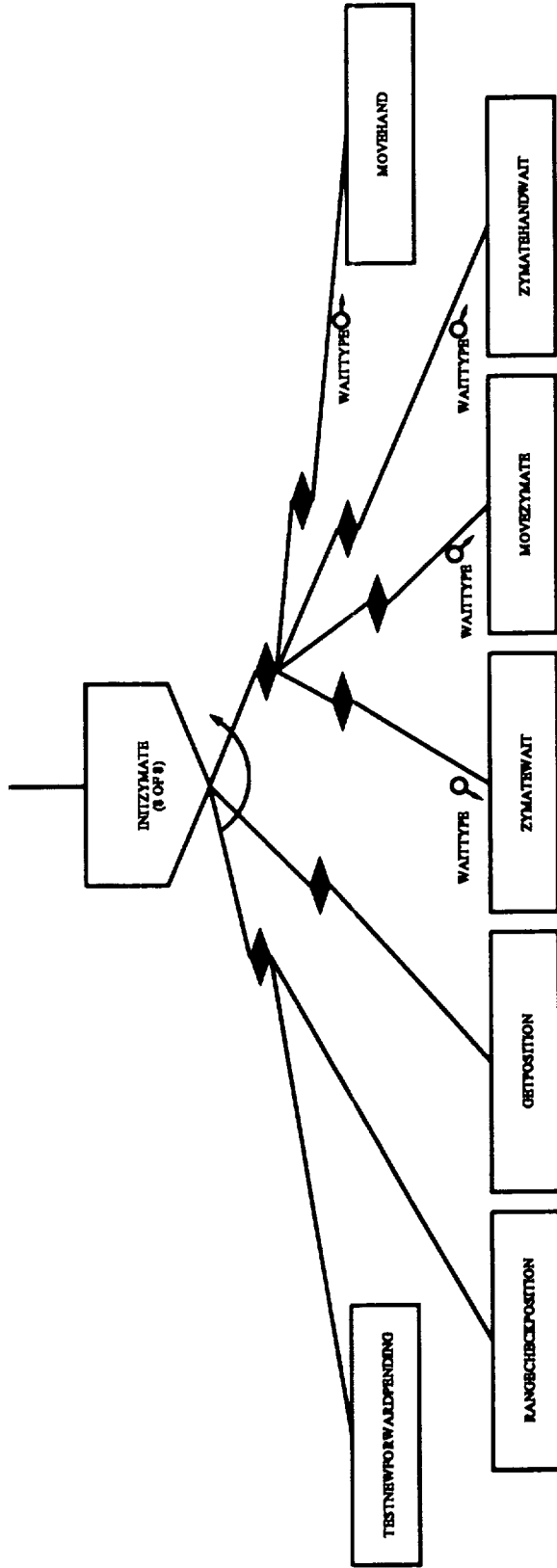


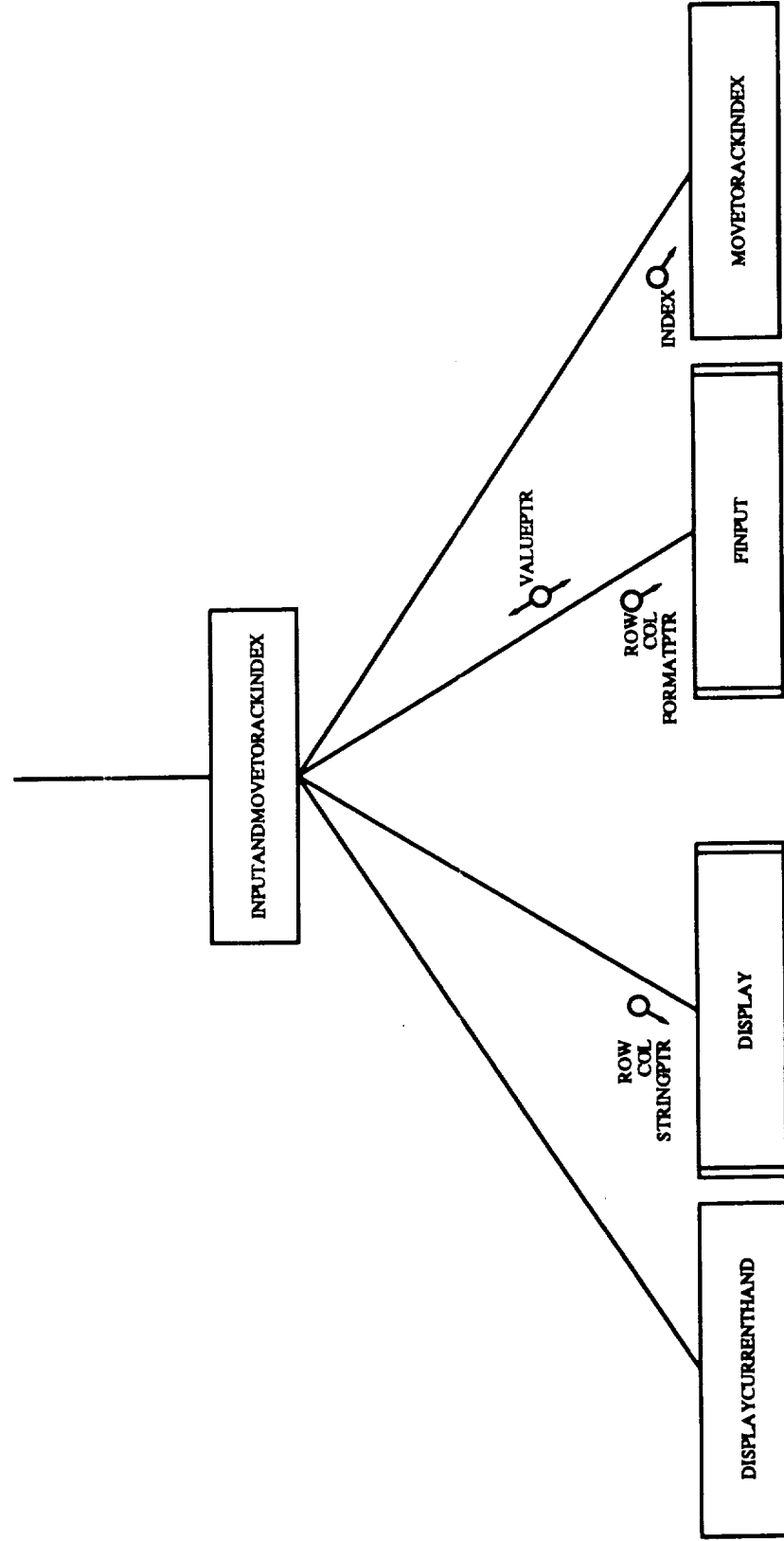


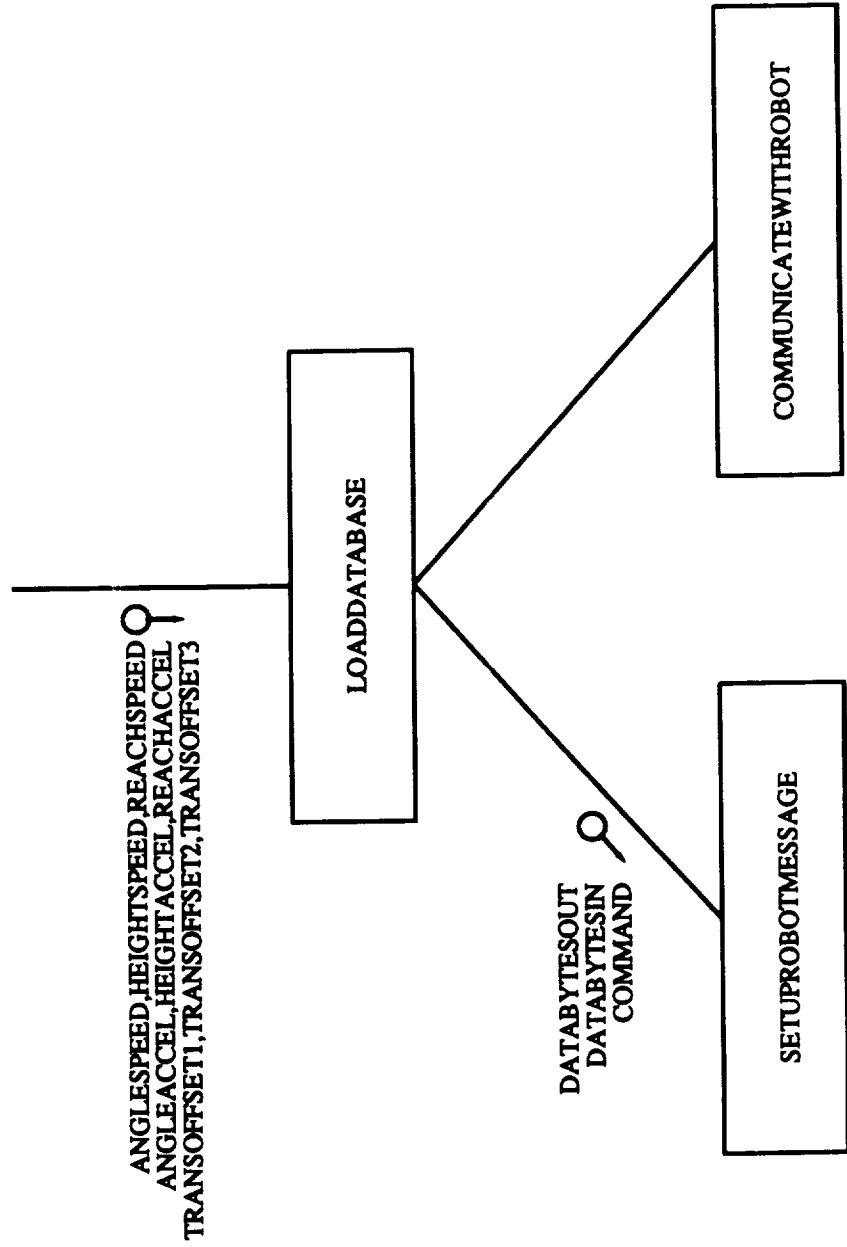


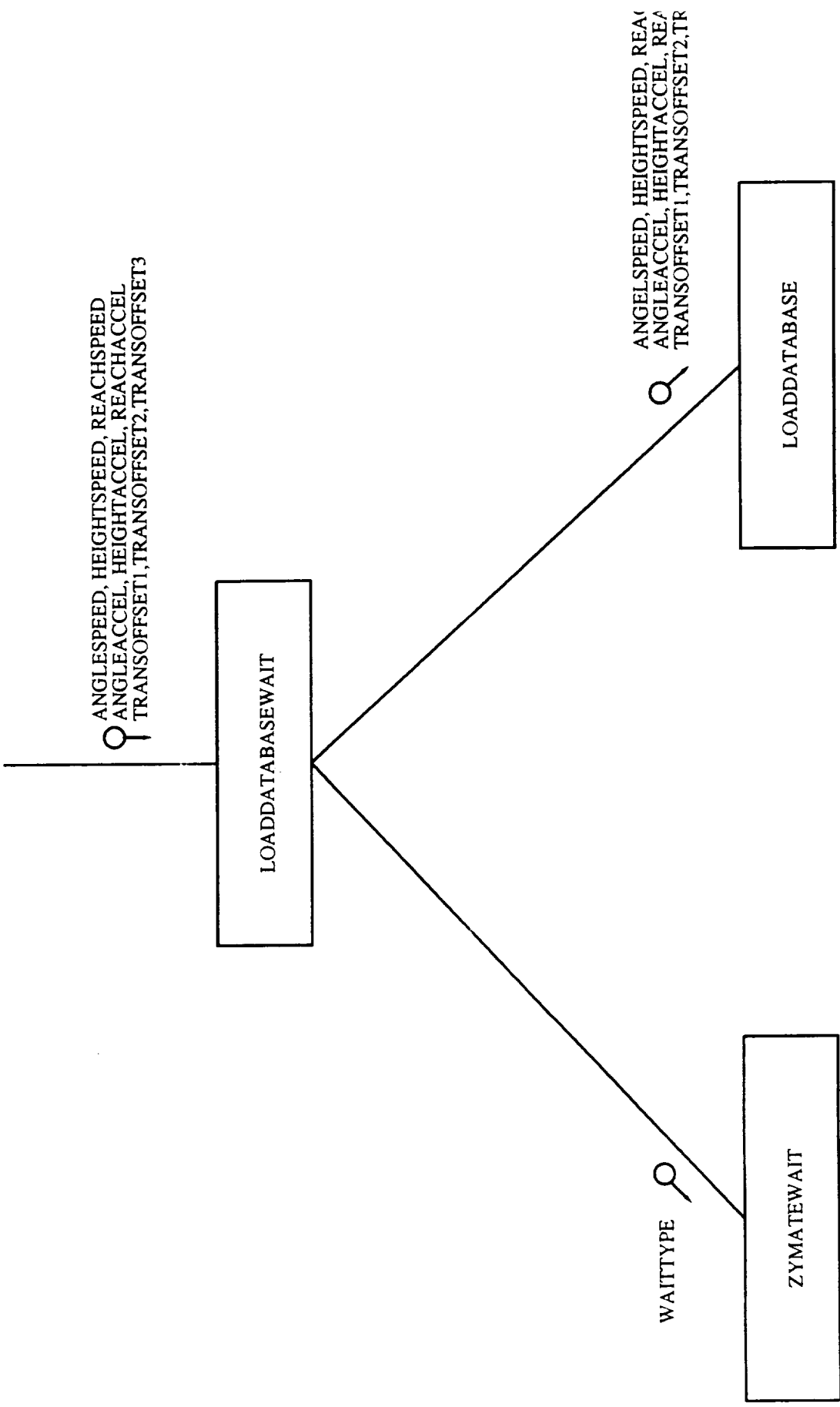


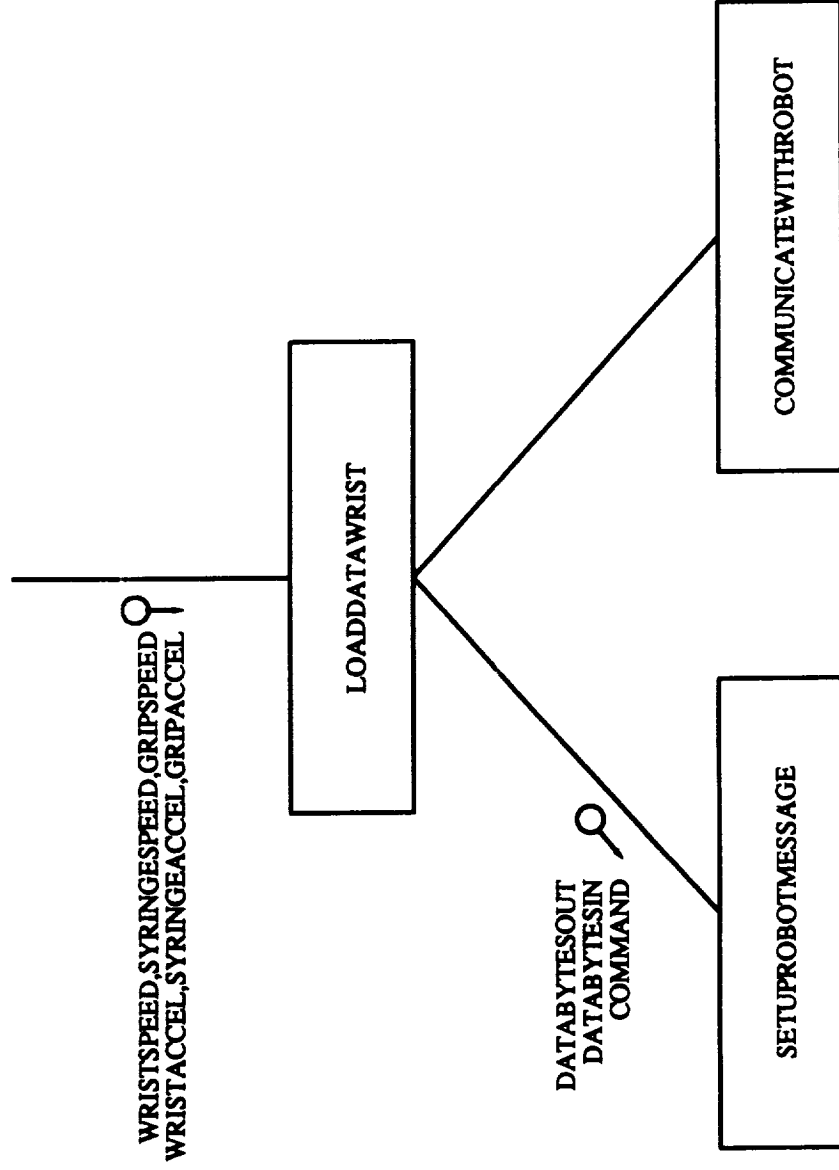


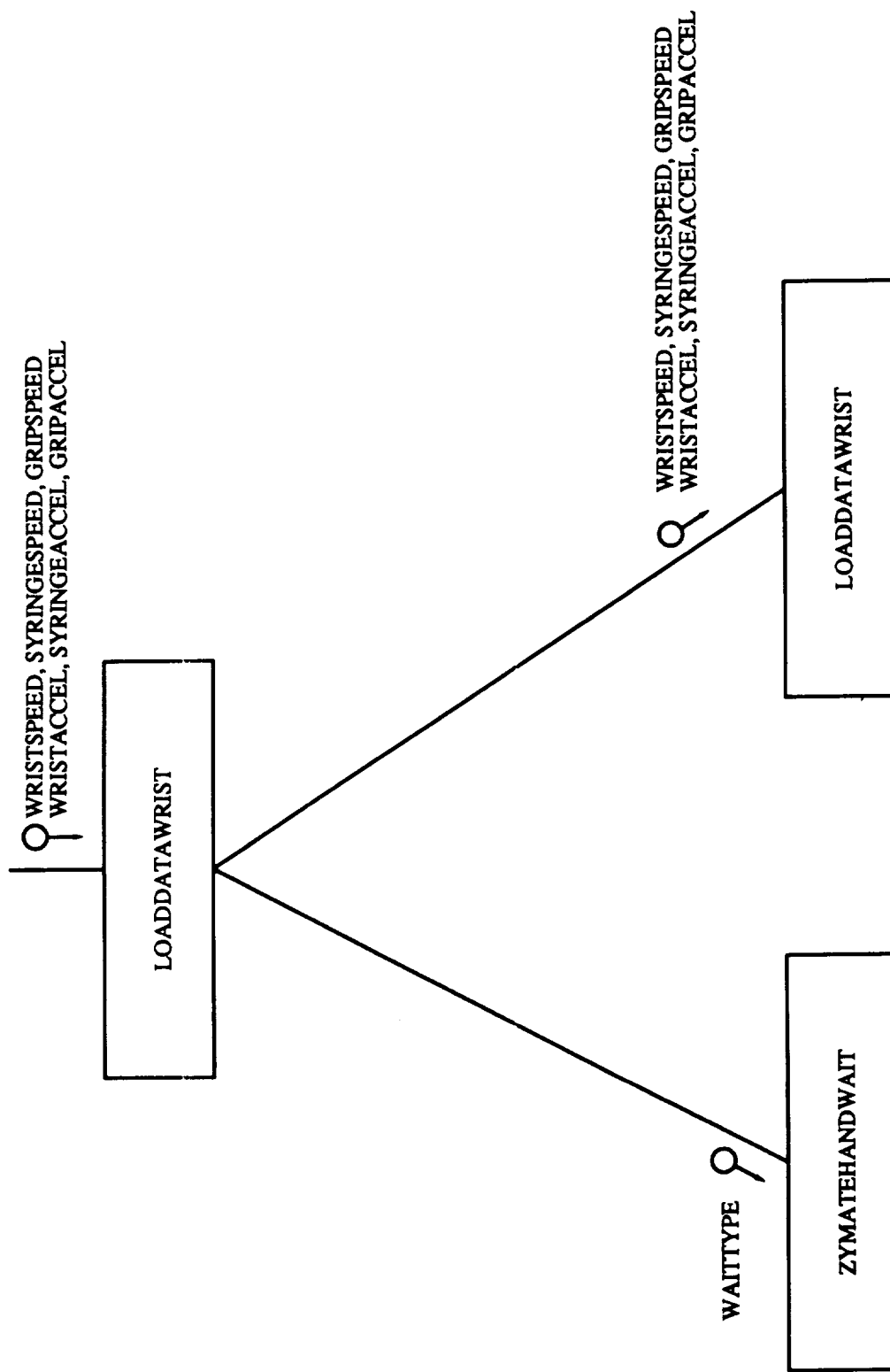


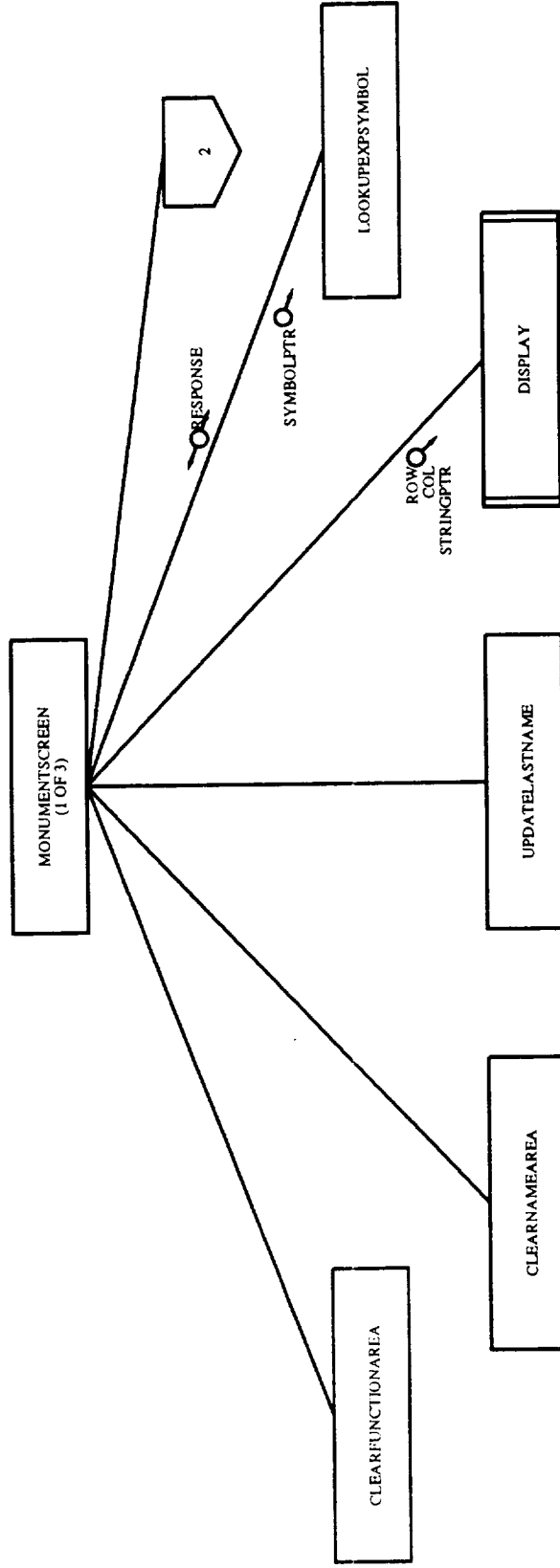


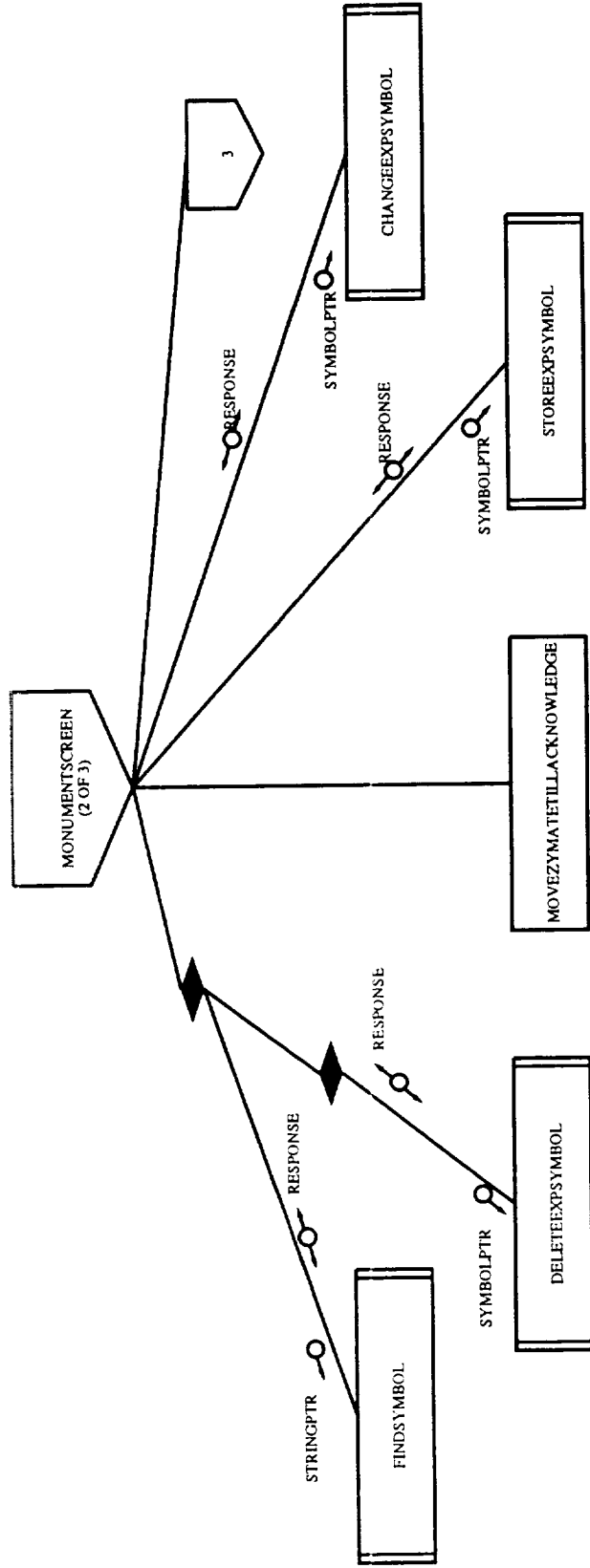


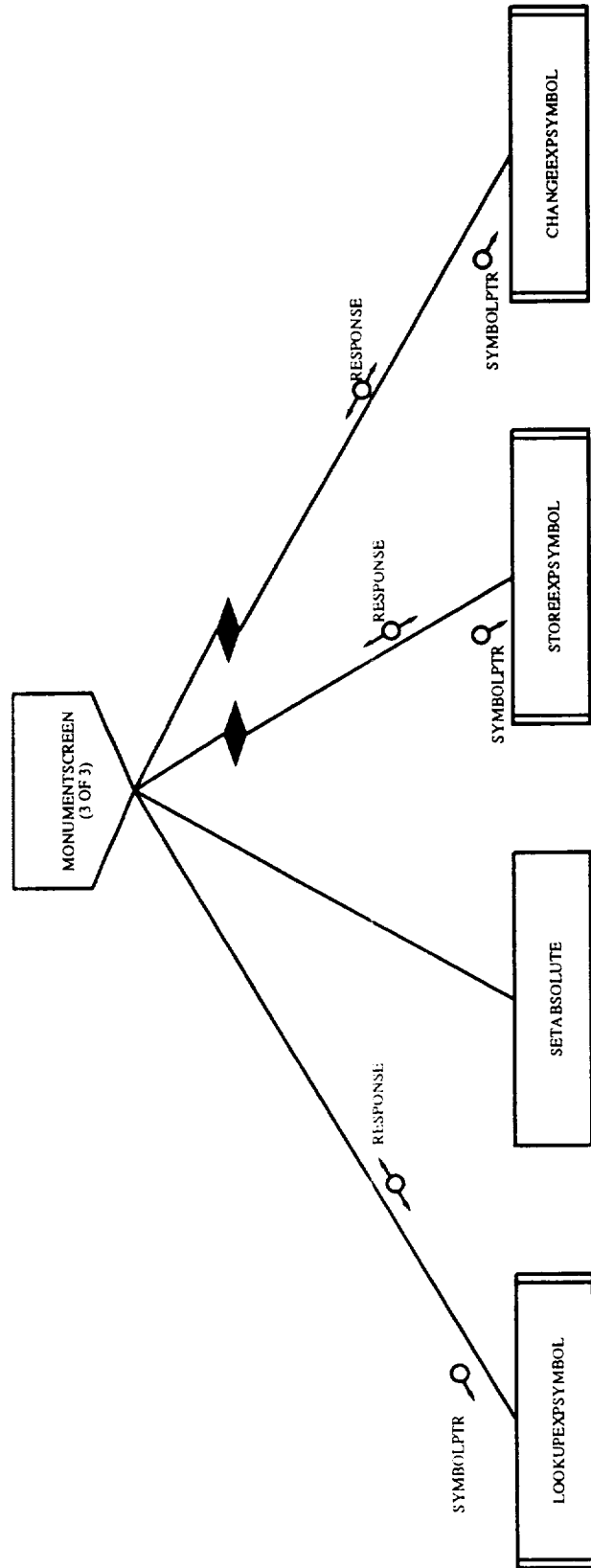


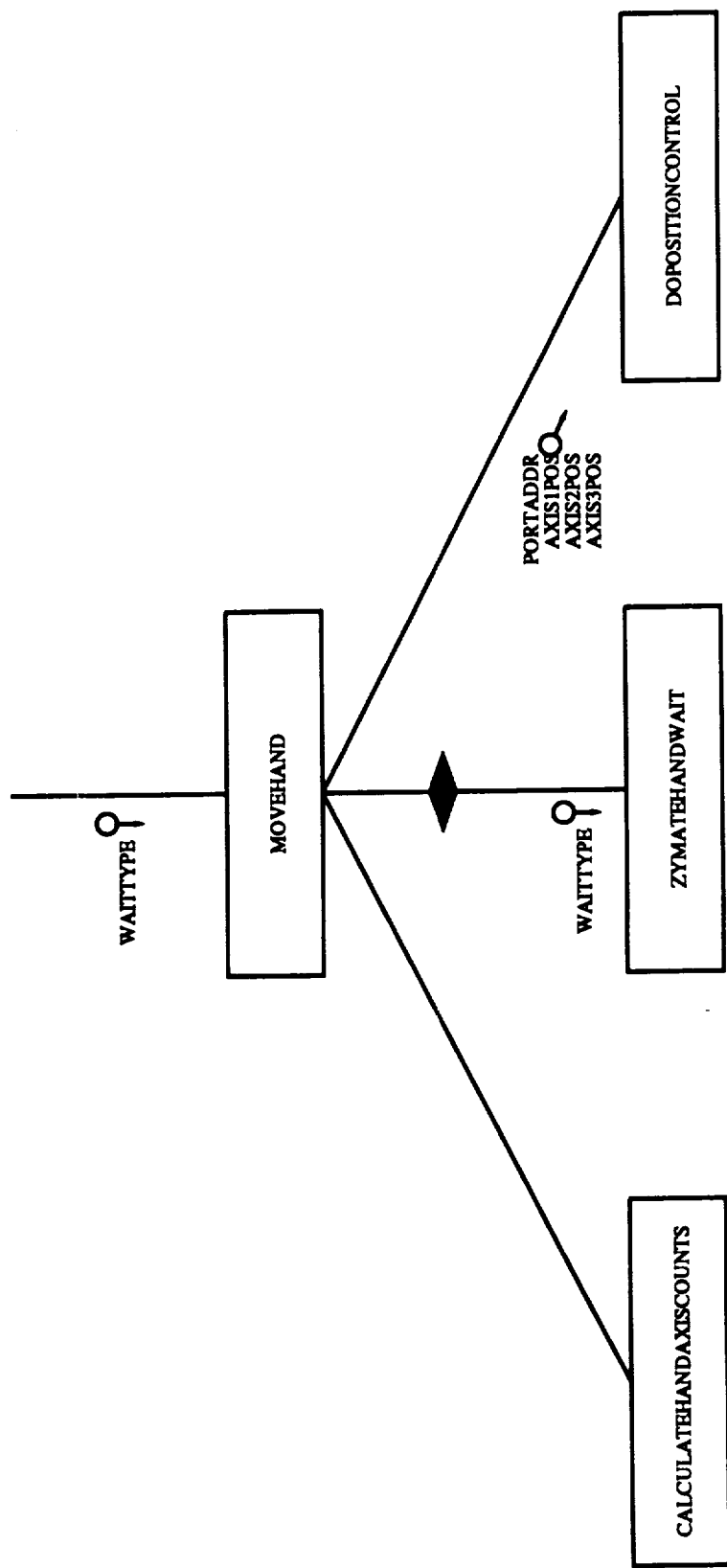


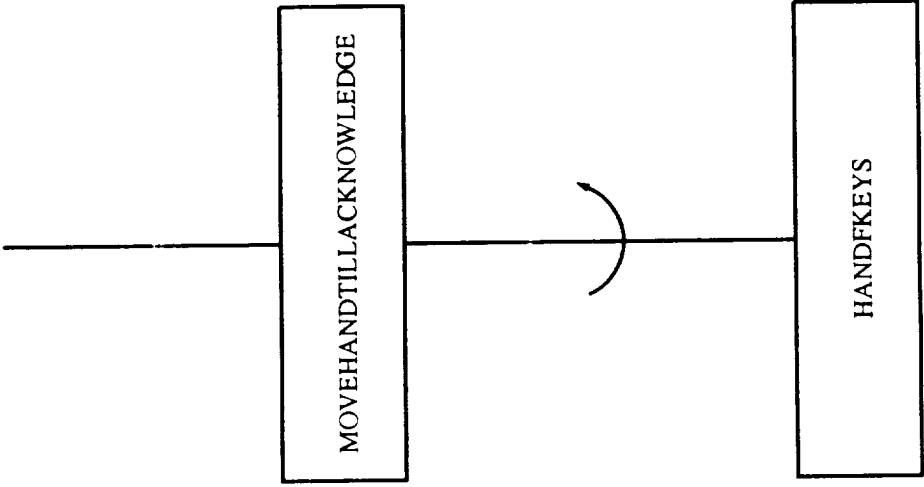


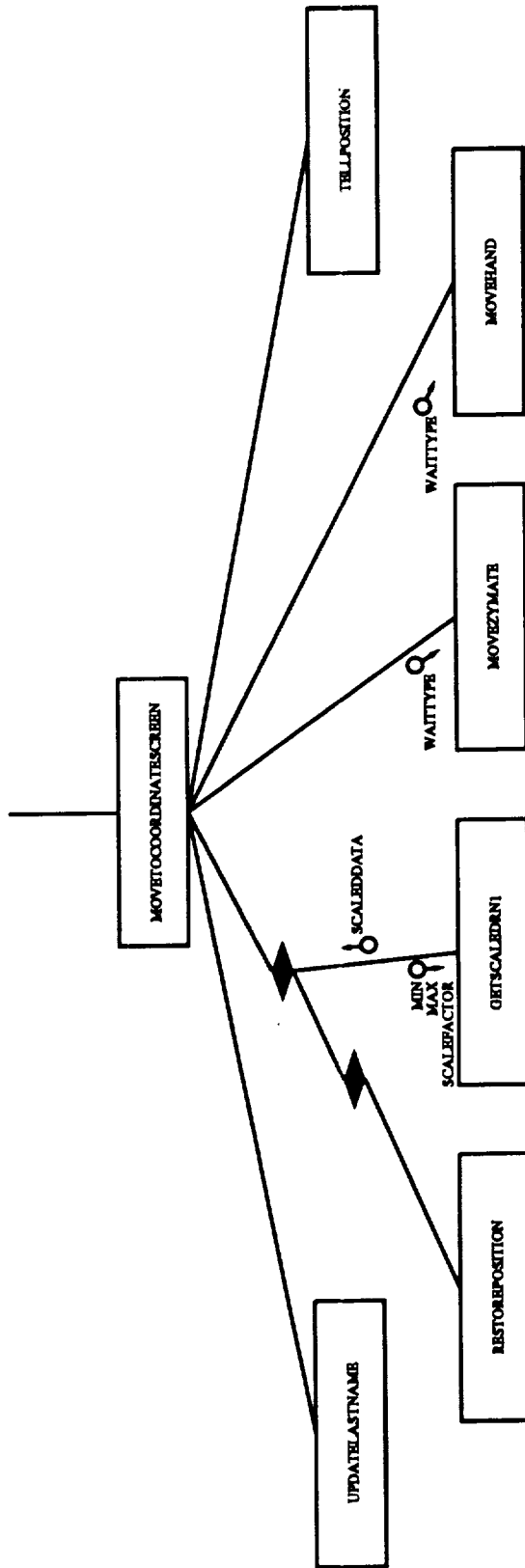


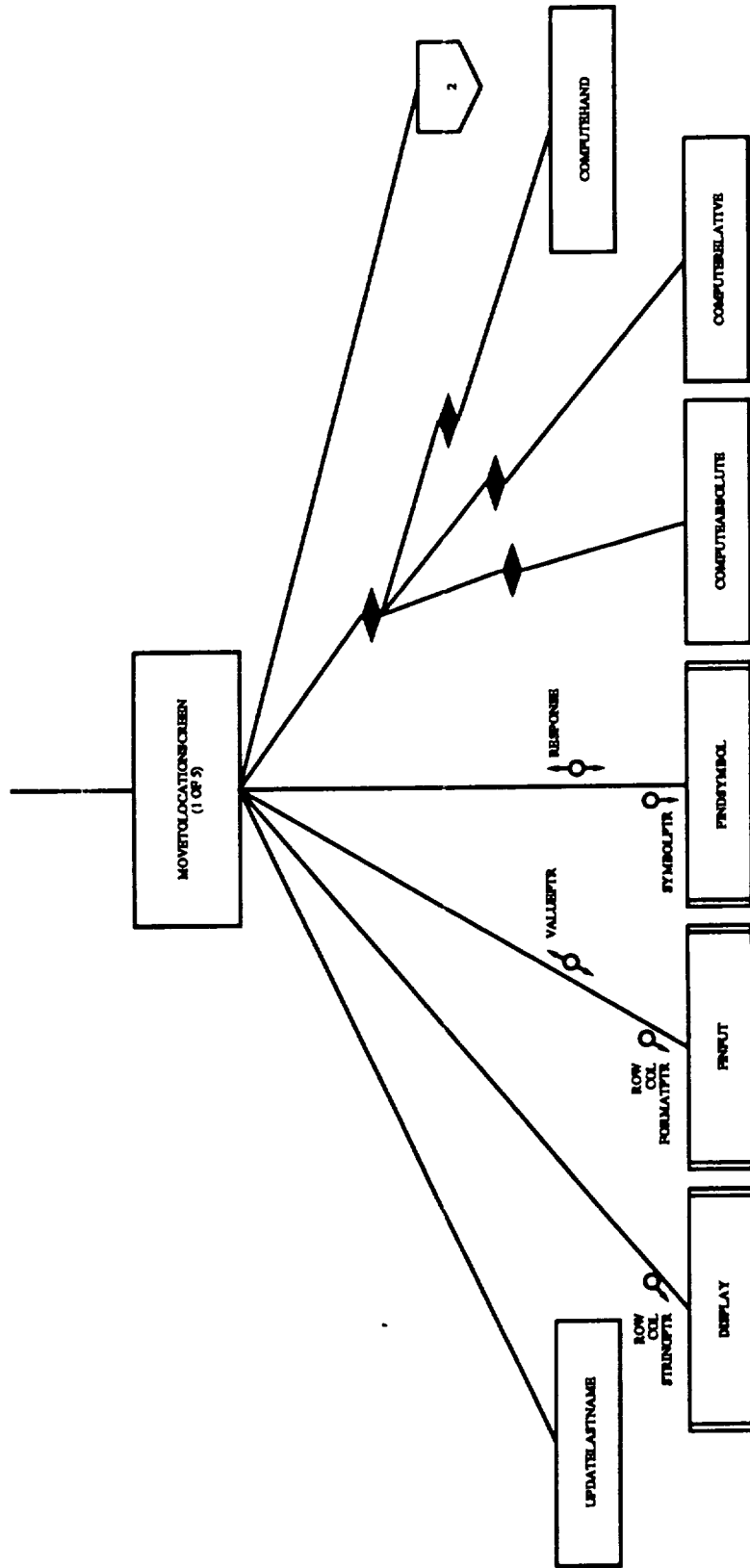


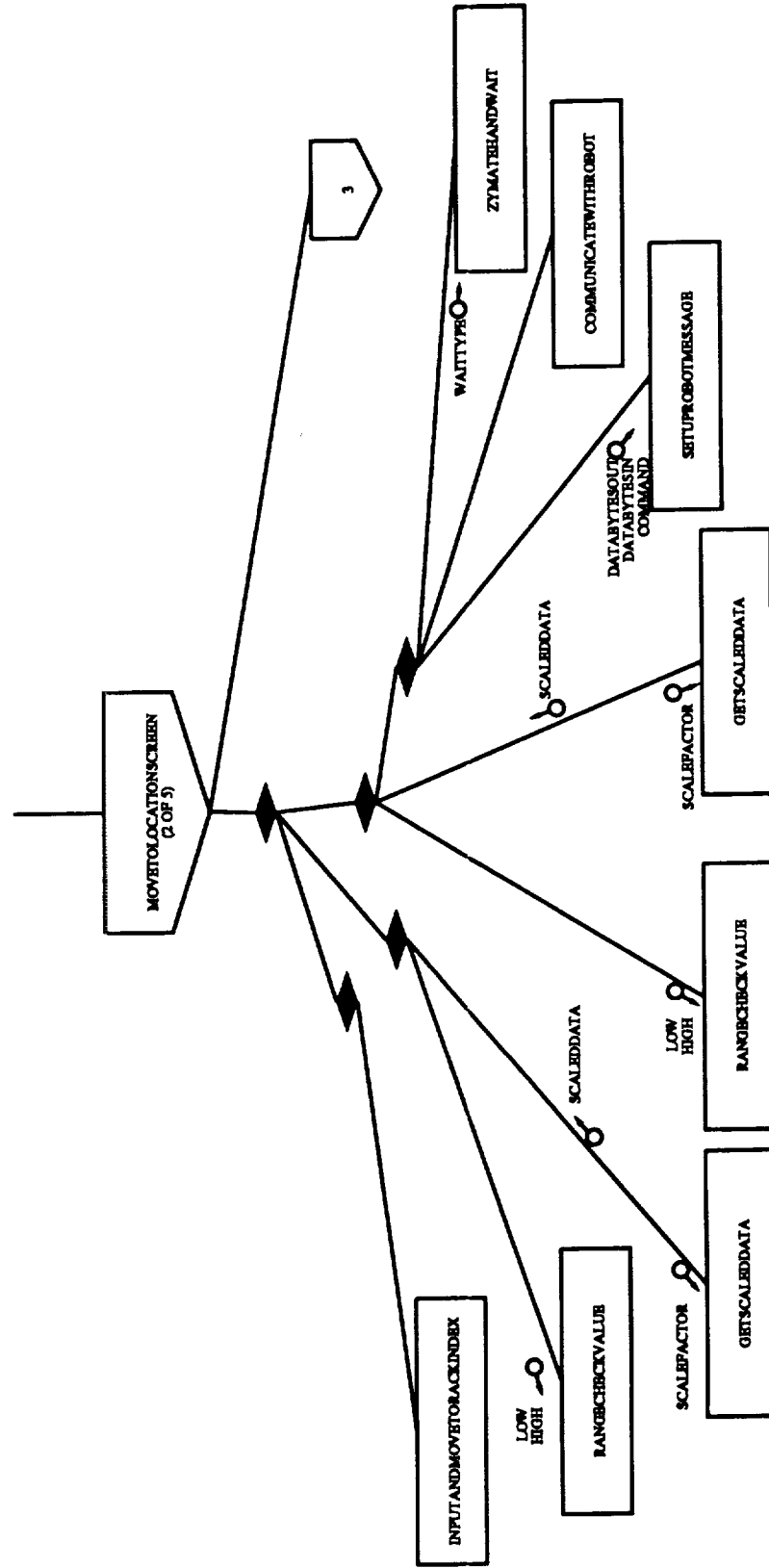


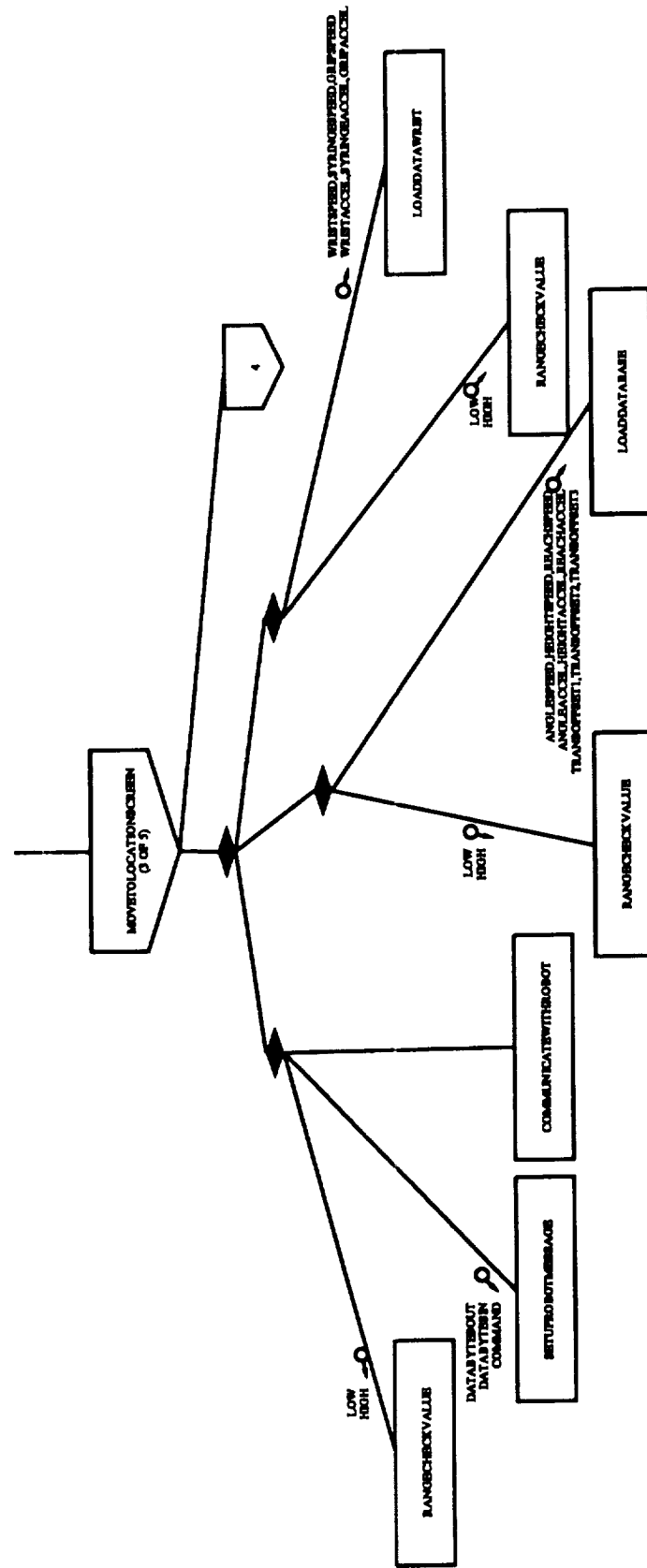


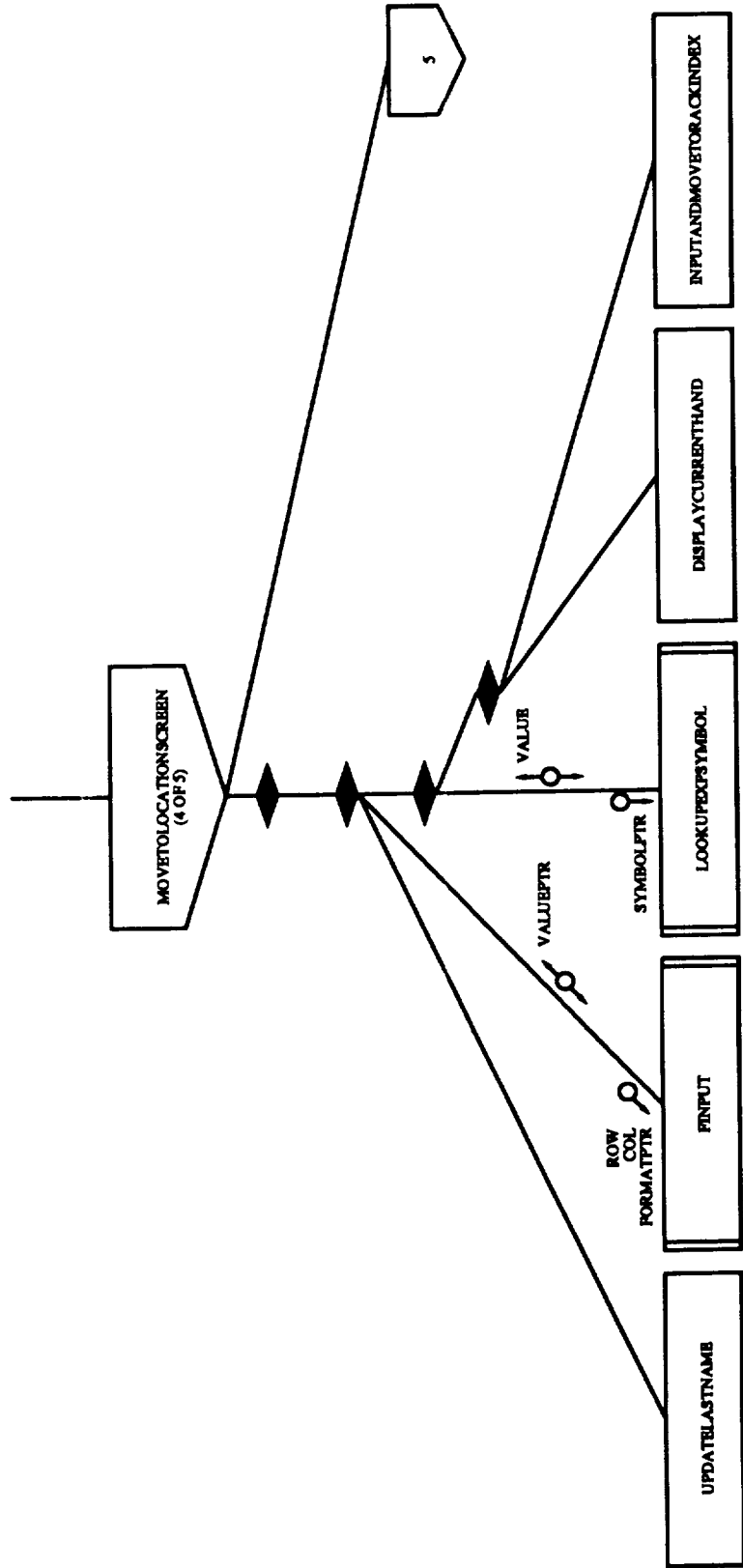


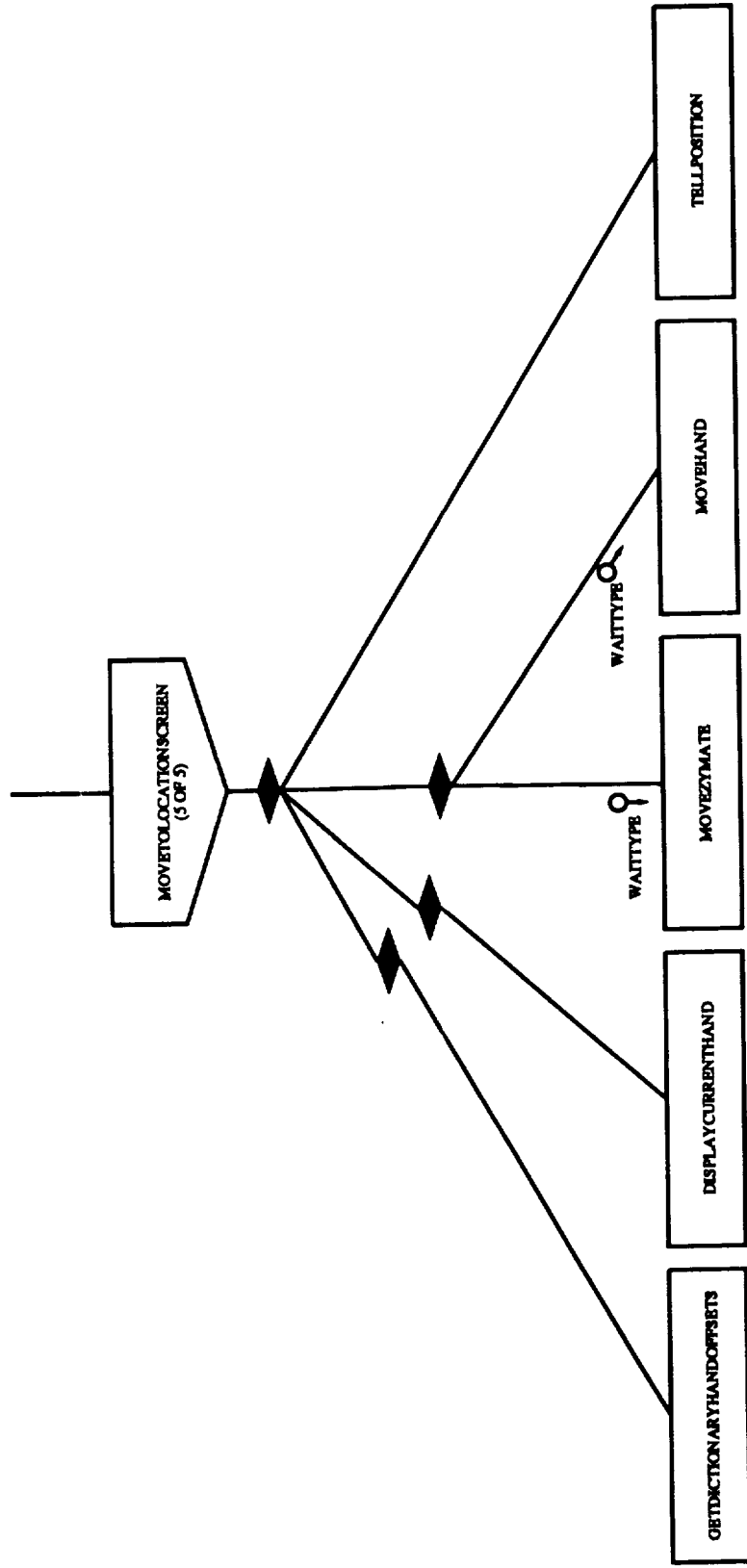


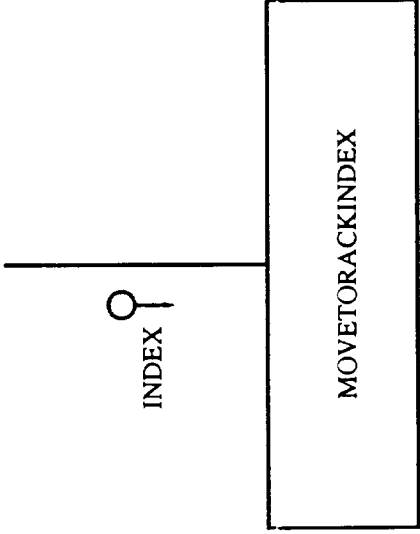


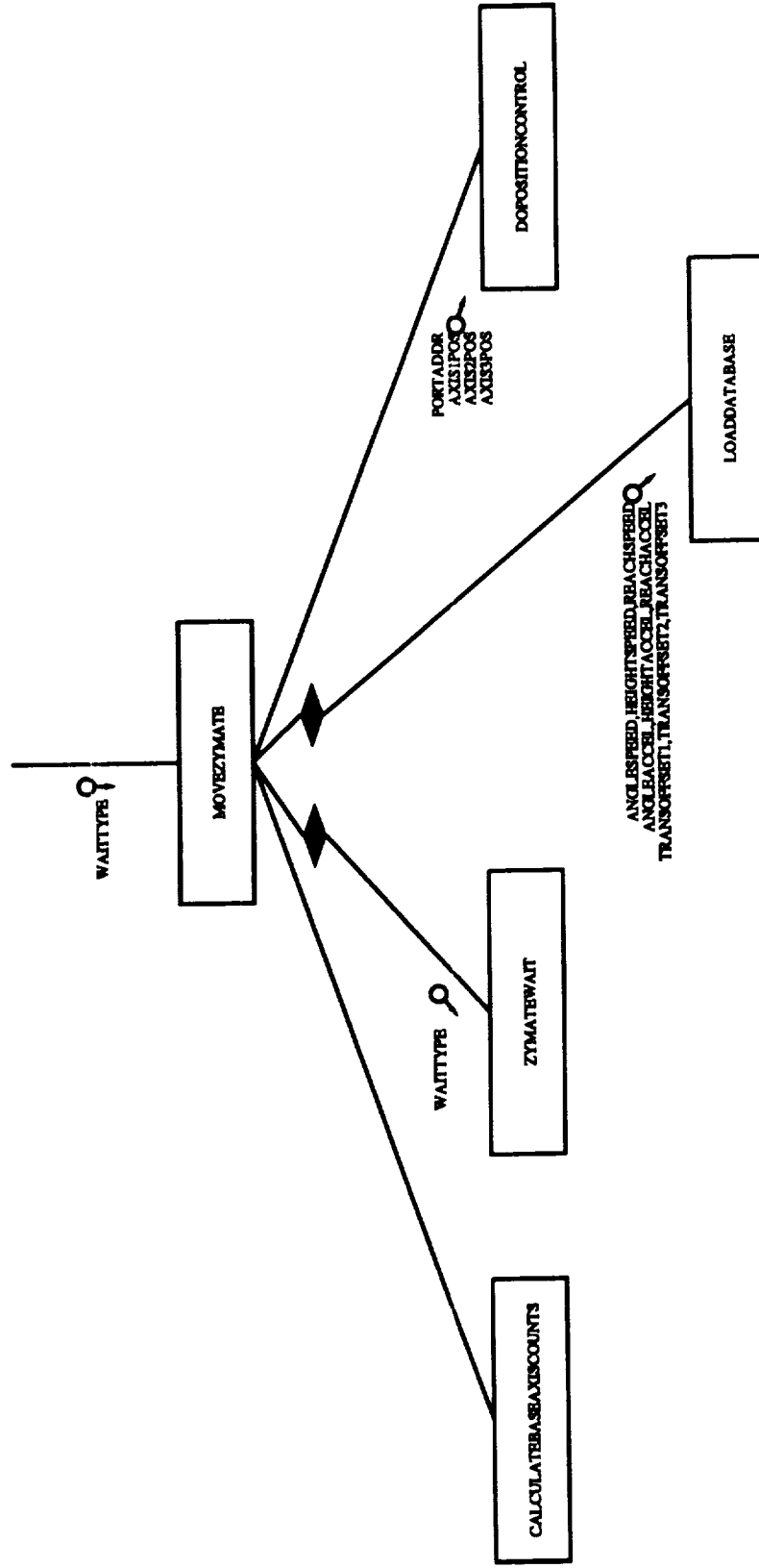


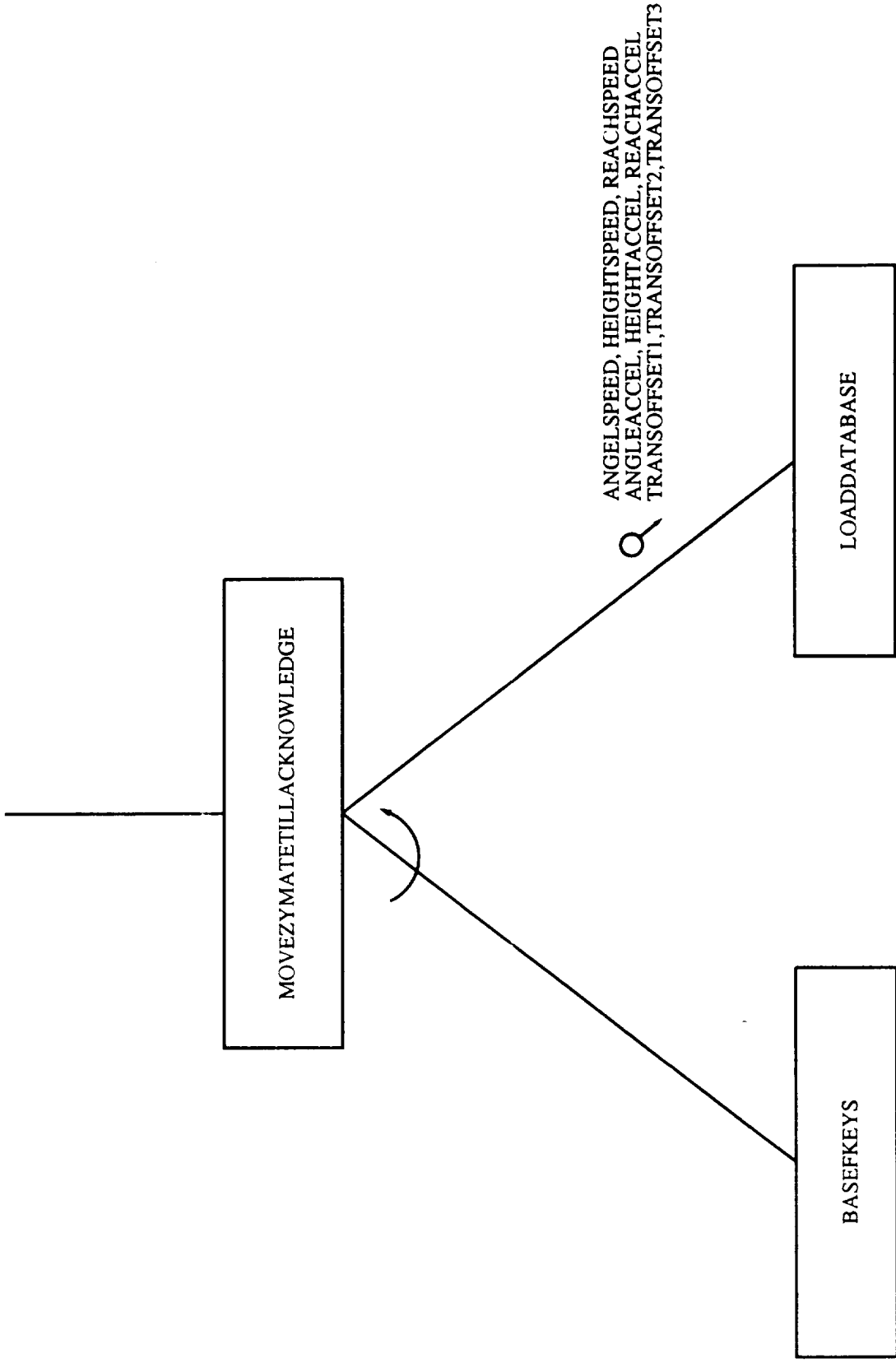


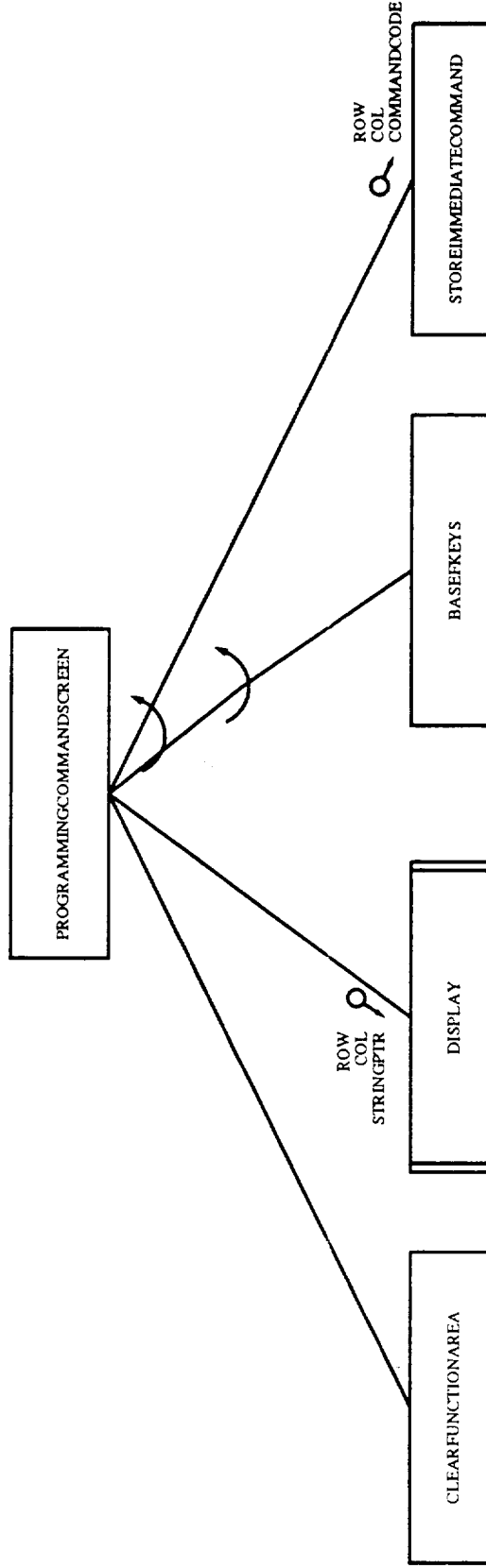


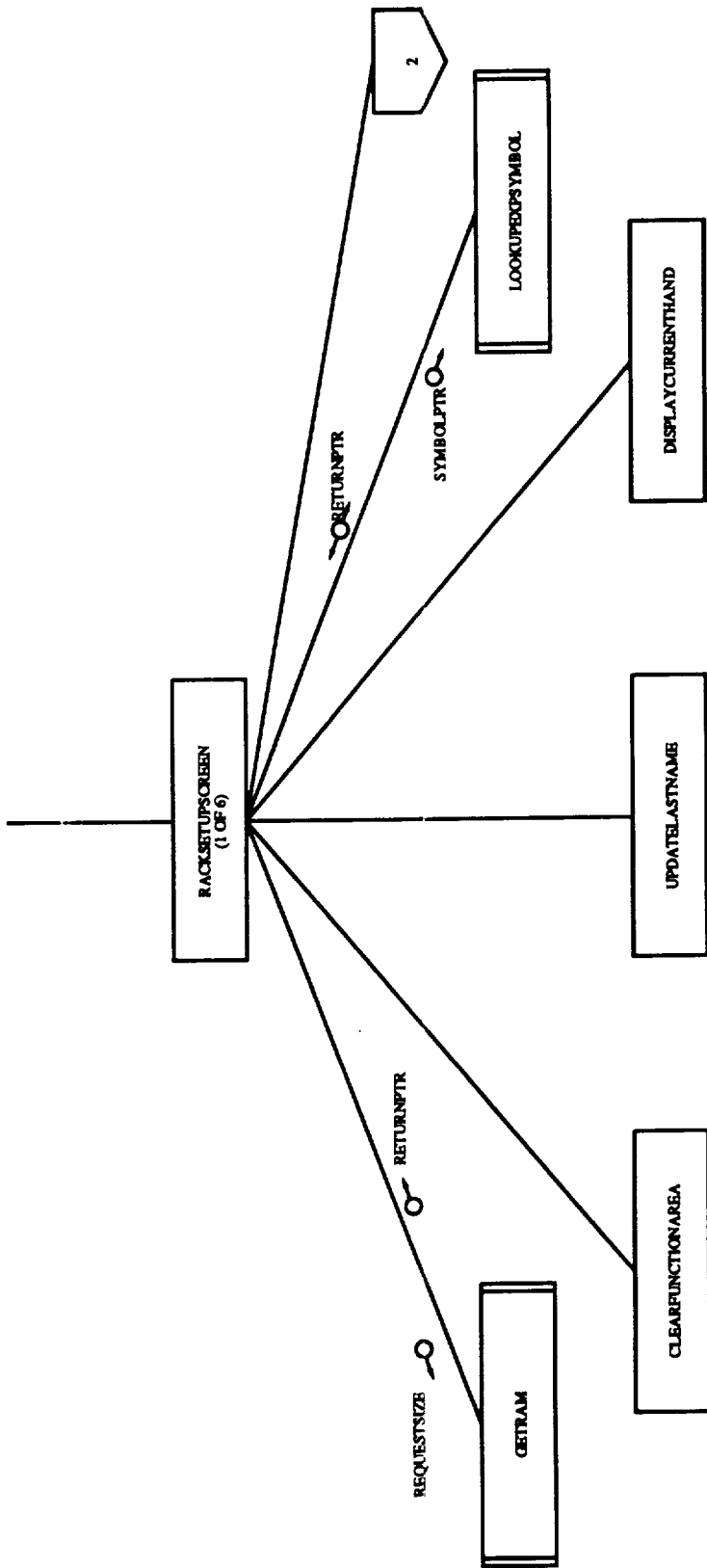


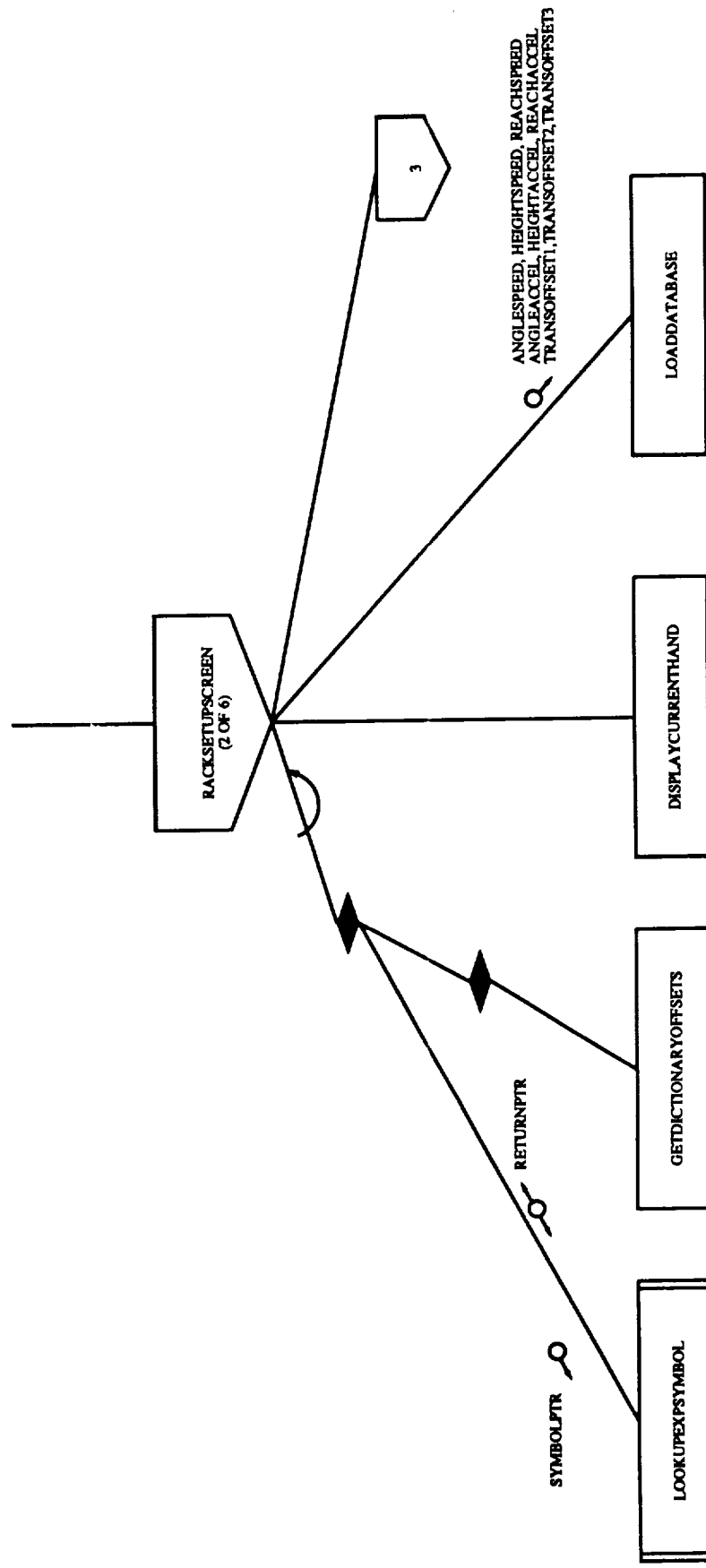


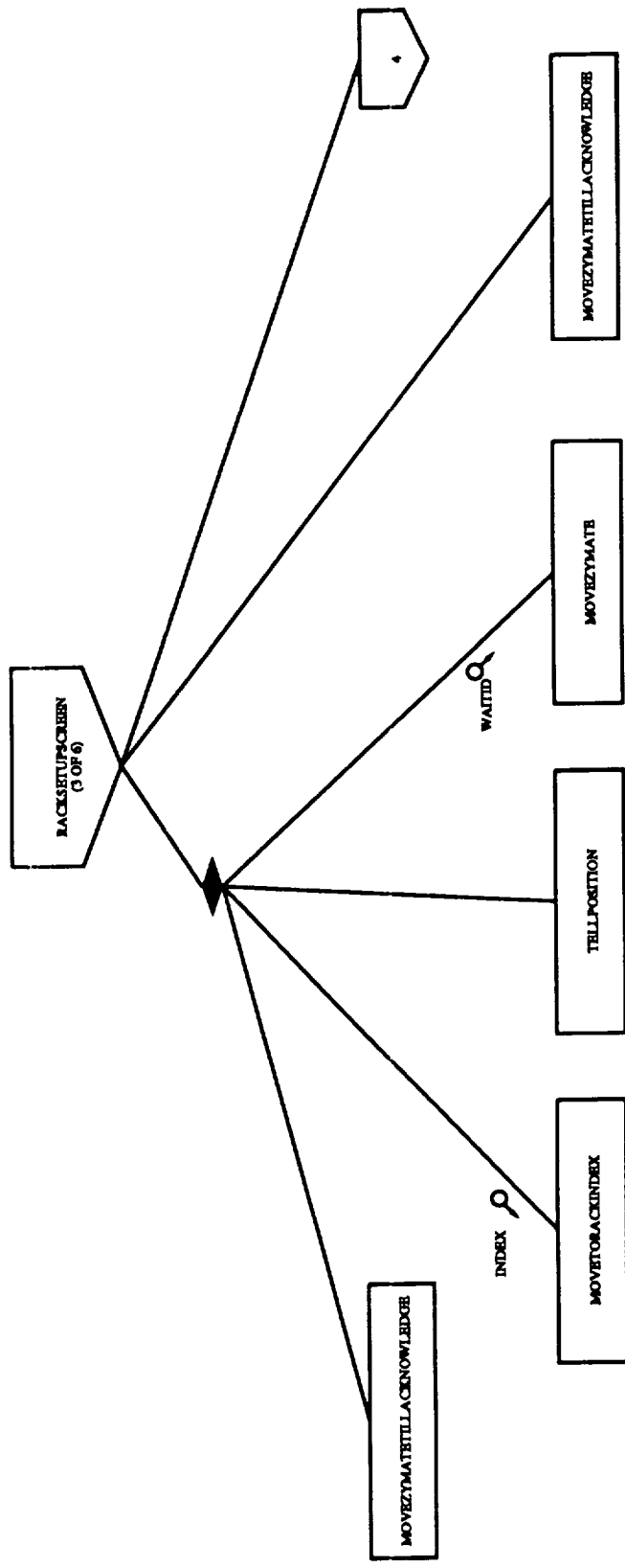


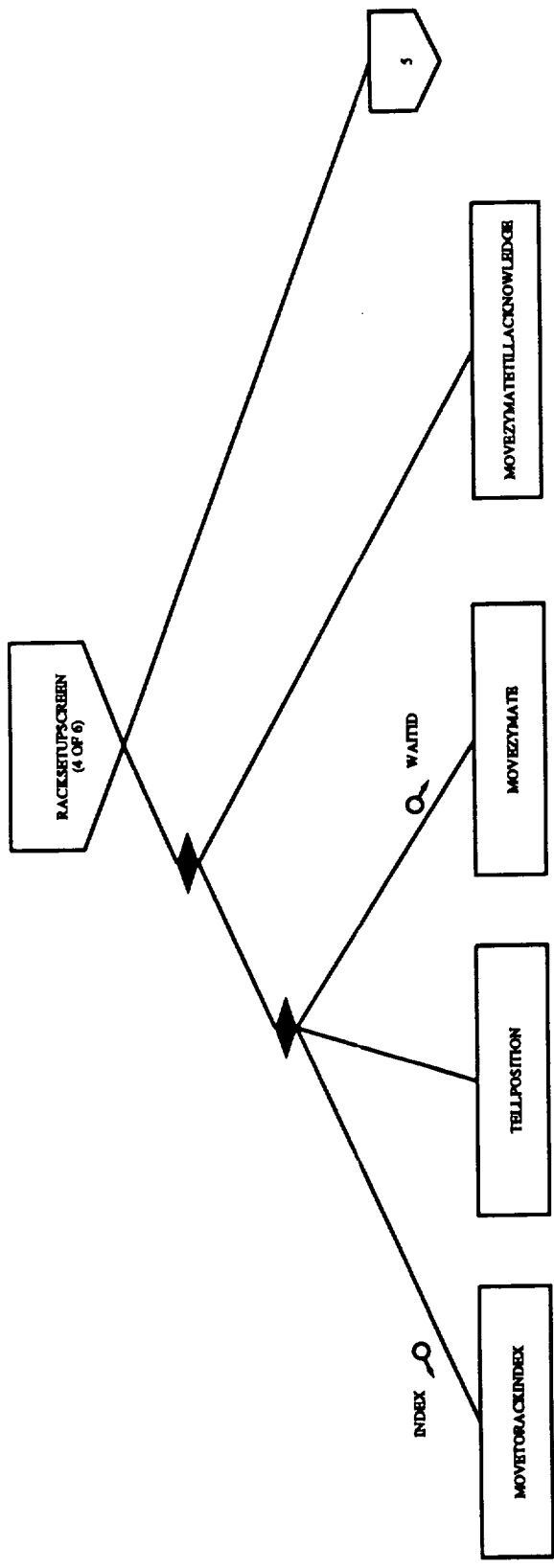


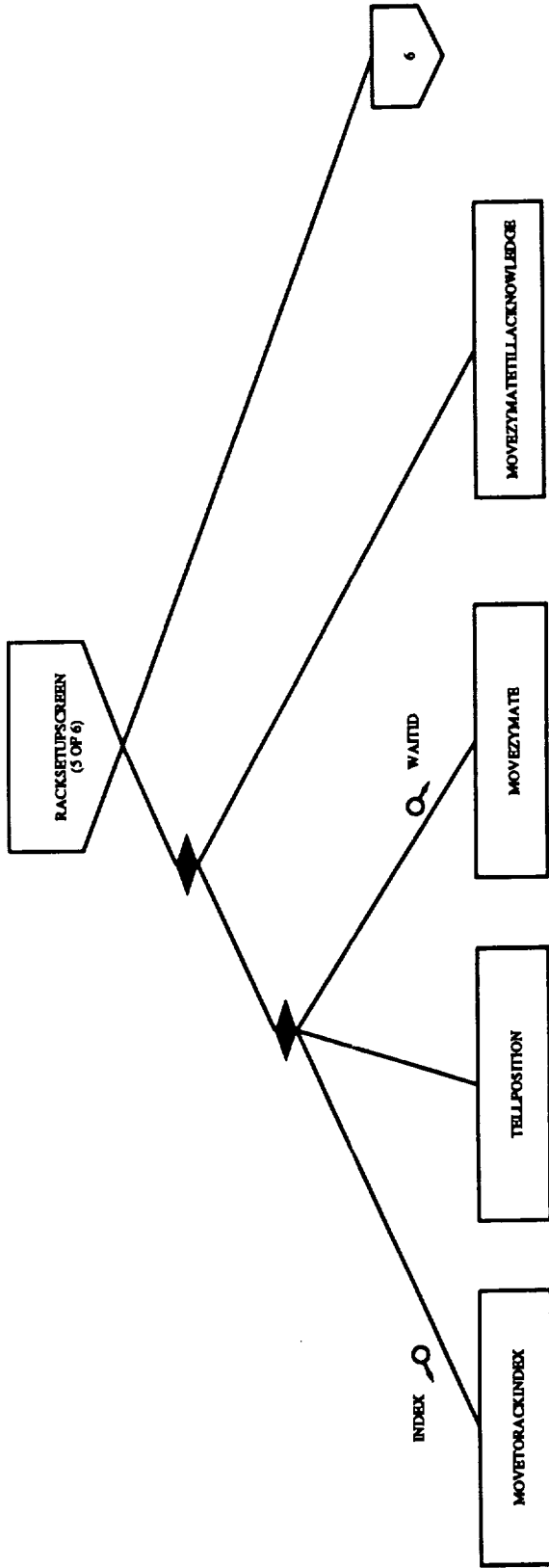


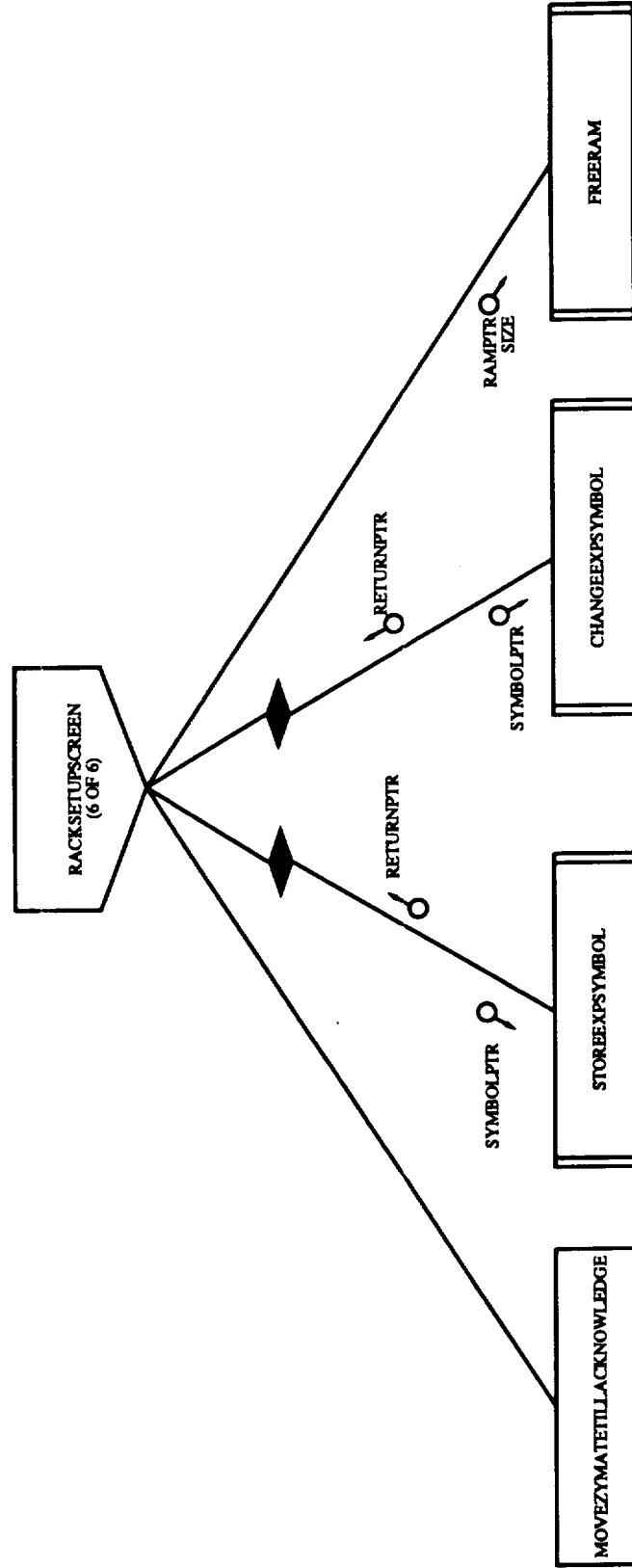






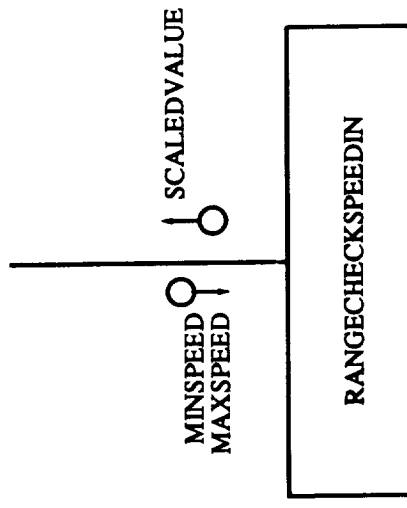


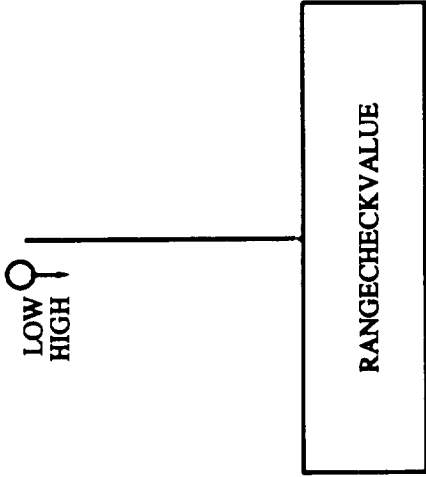


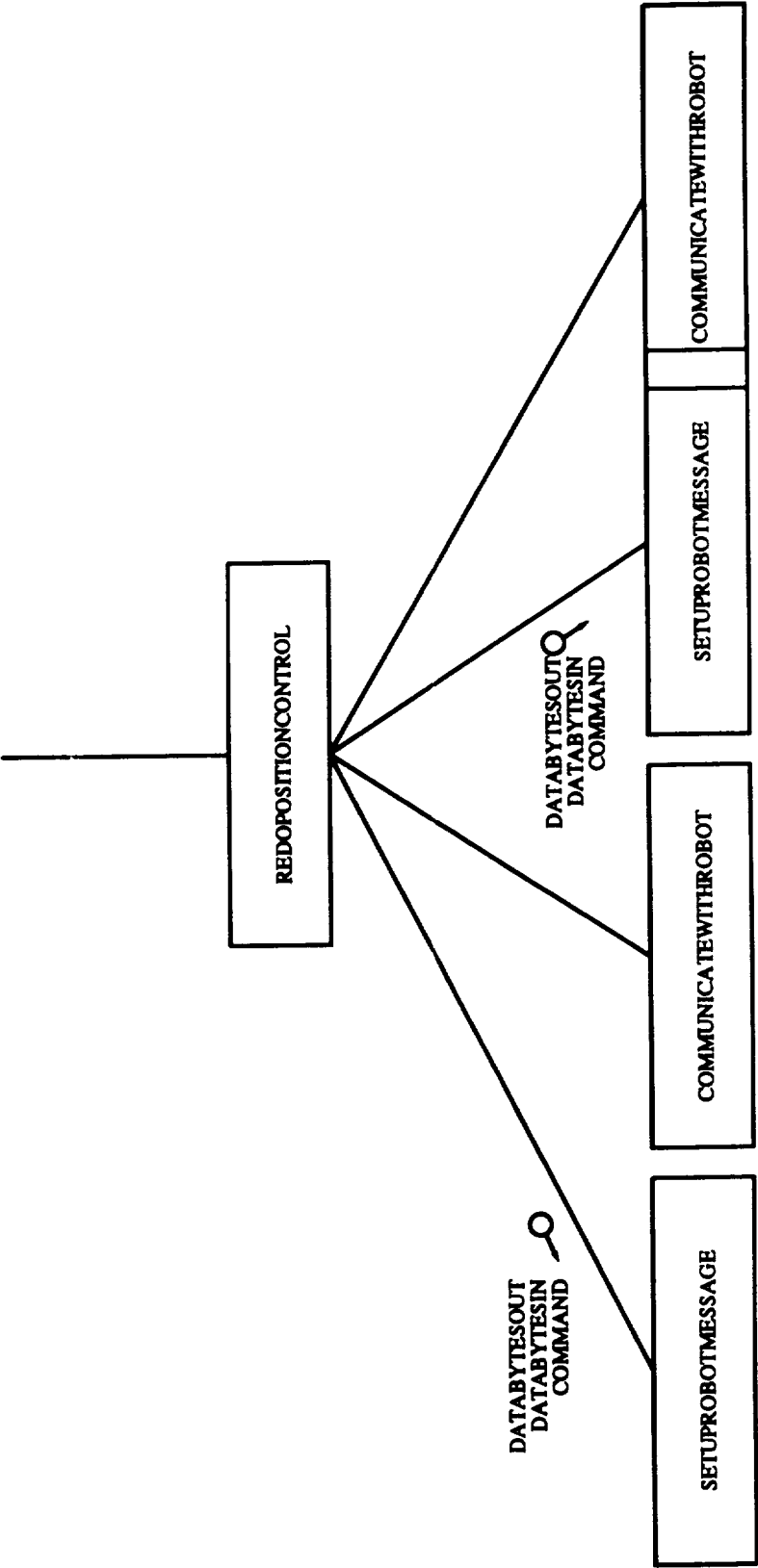




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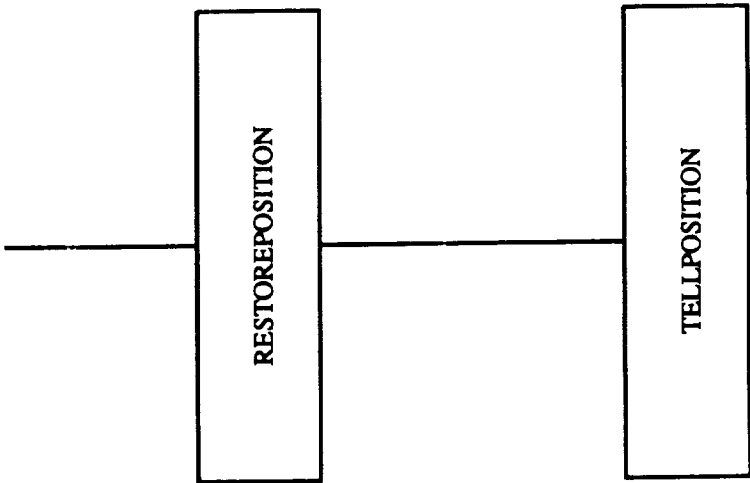


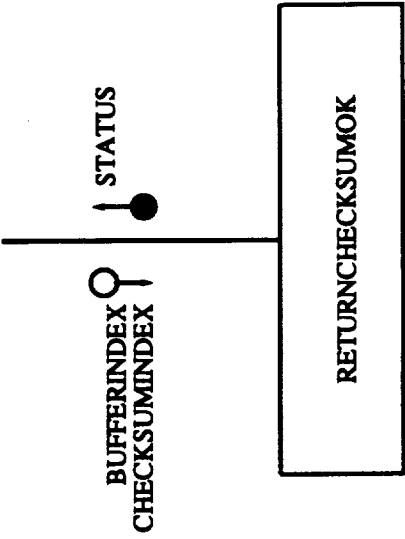


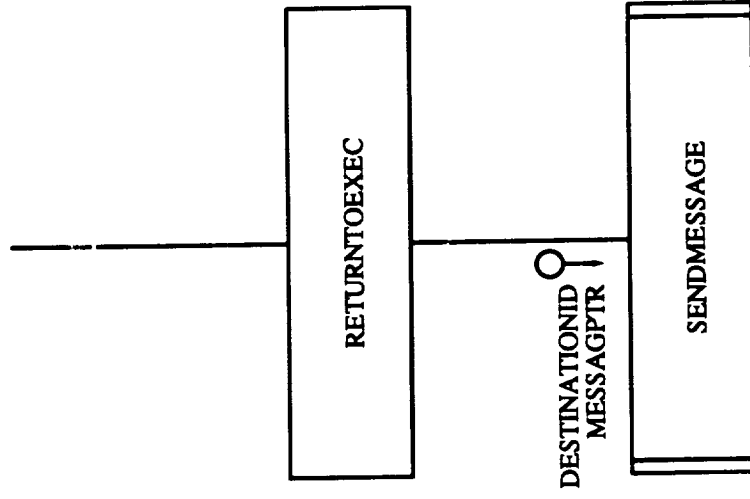


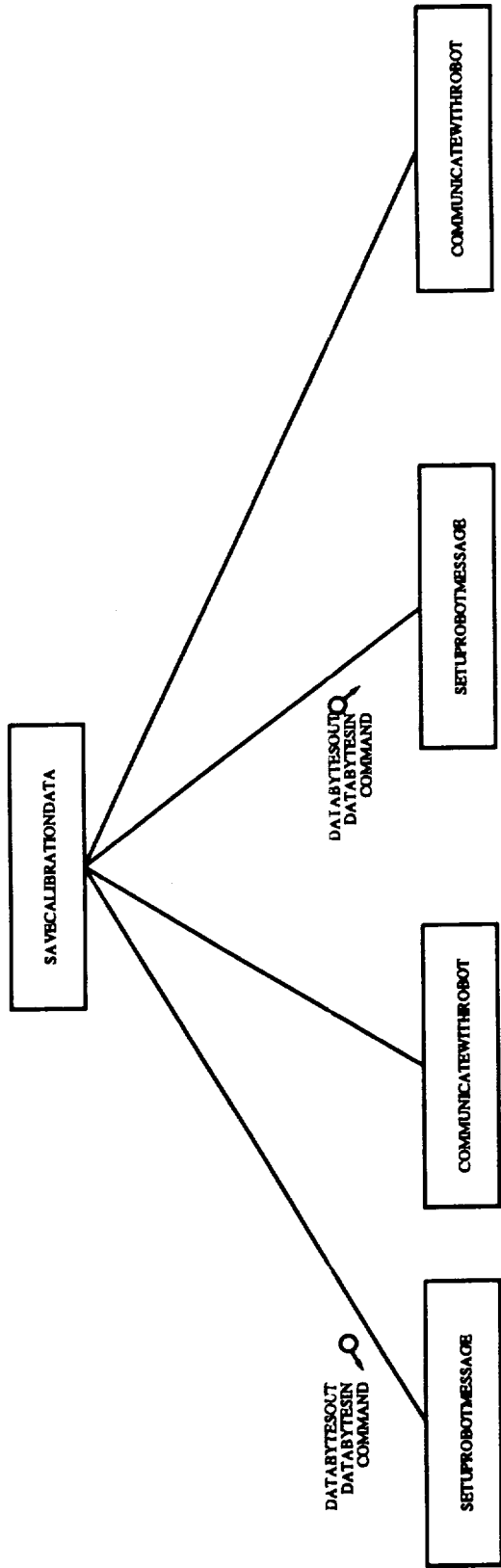


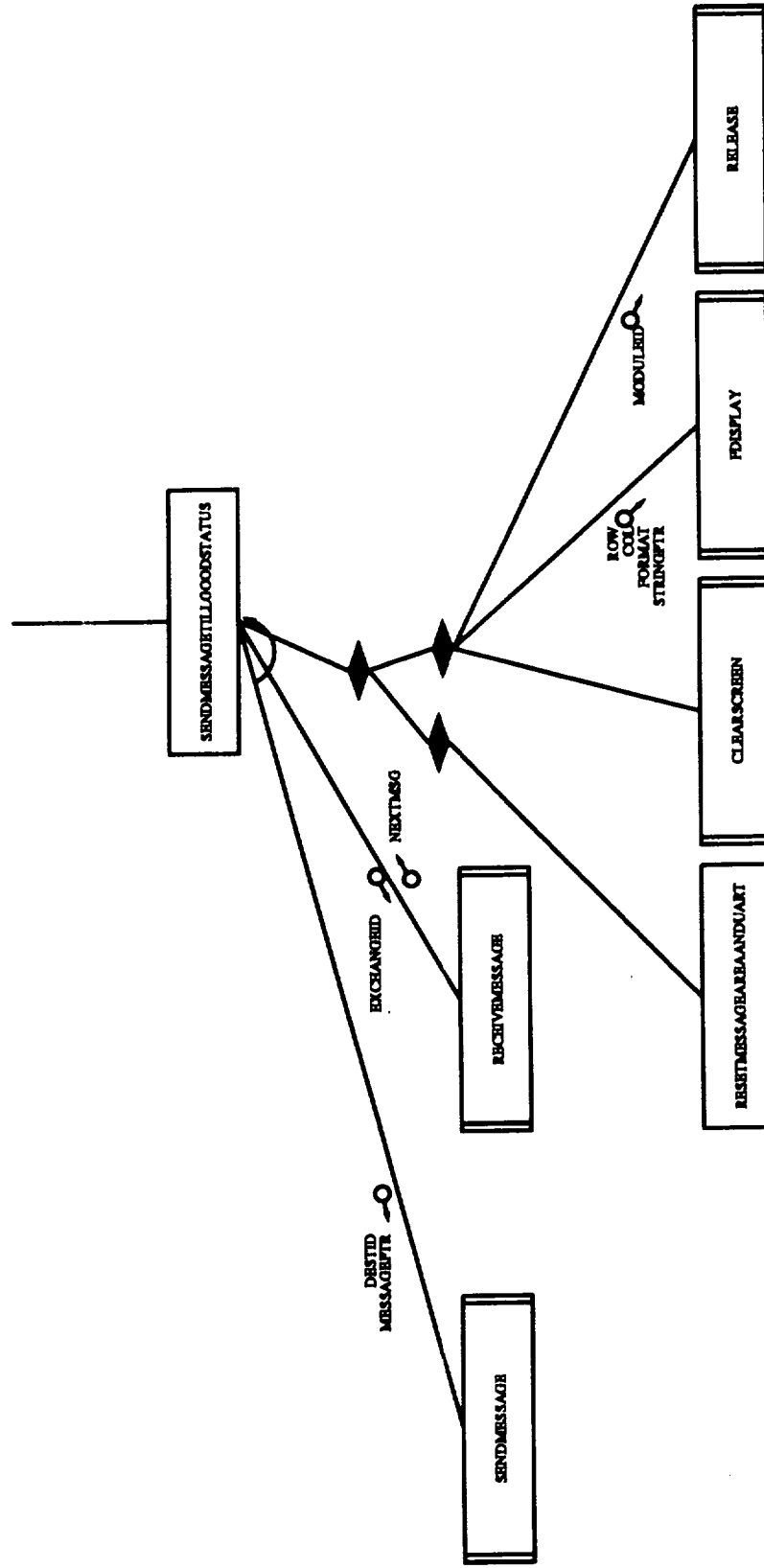
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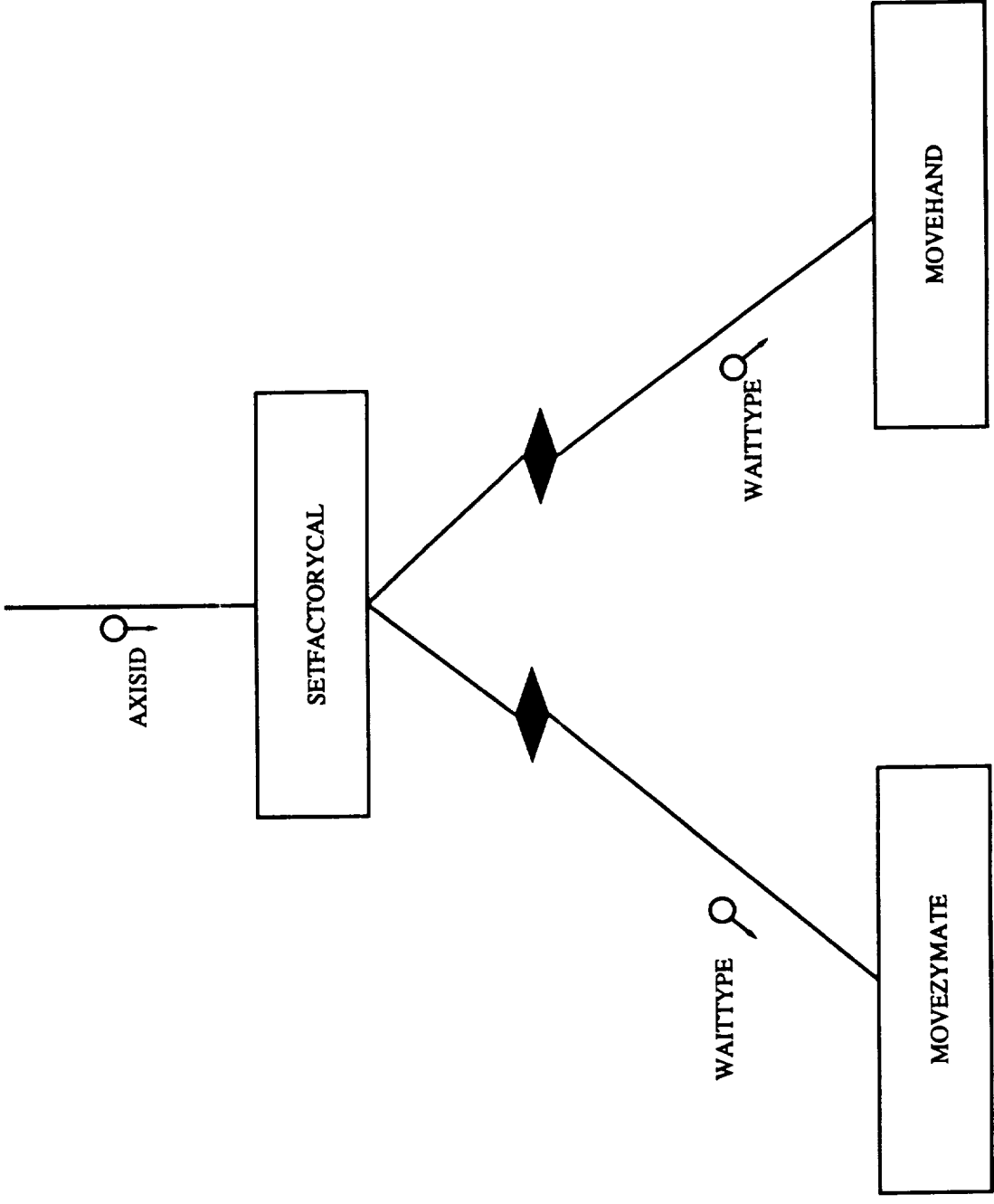


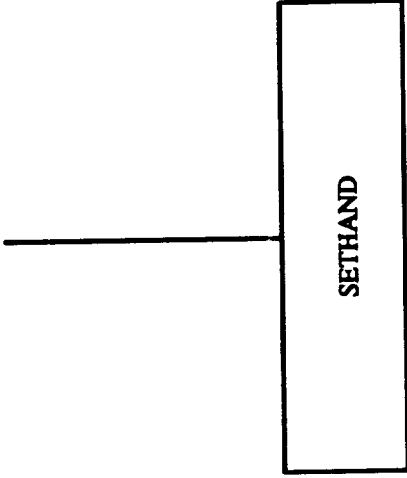


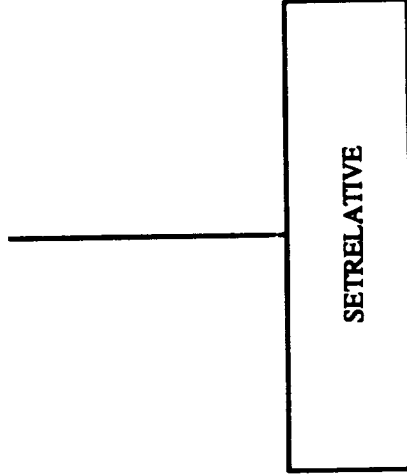




SETABSOLUTE

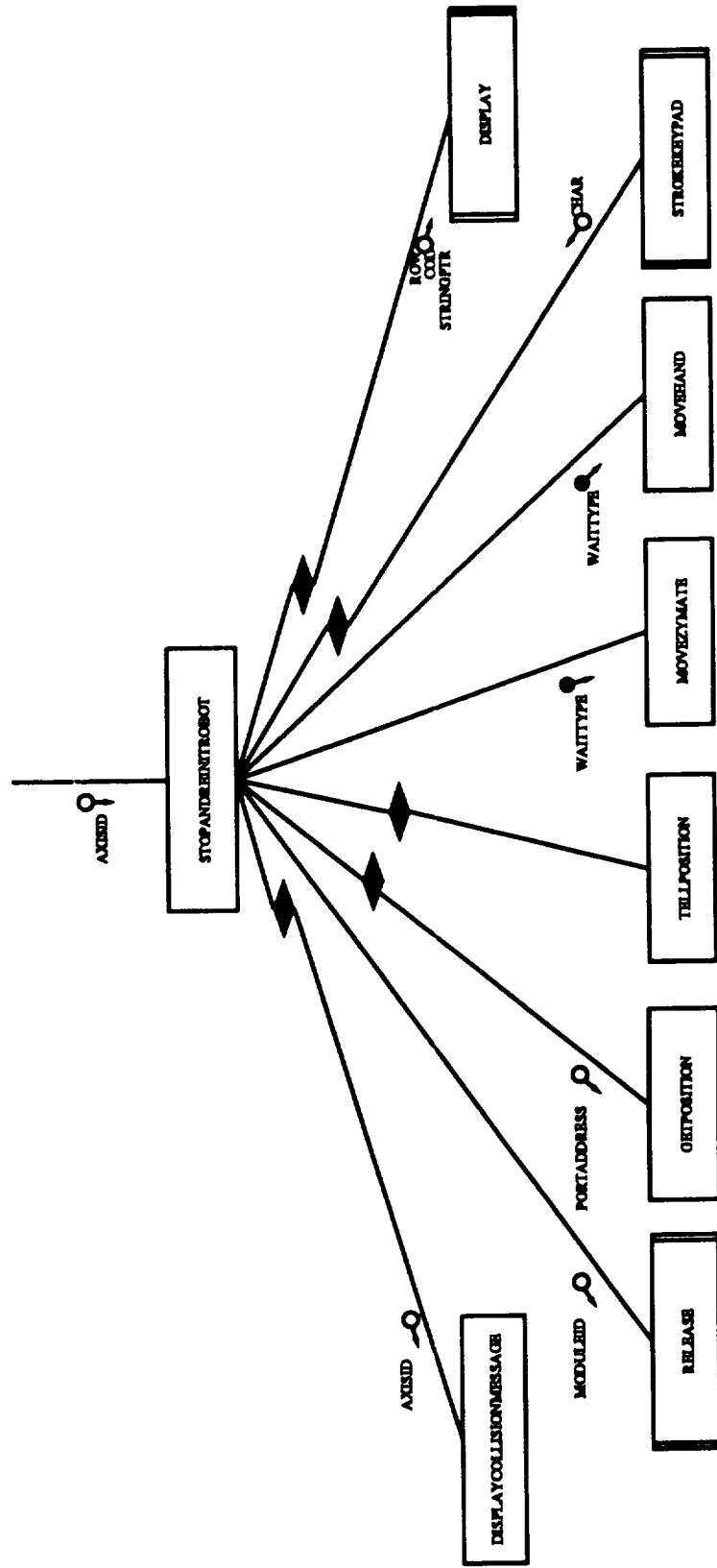


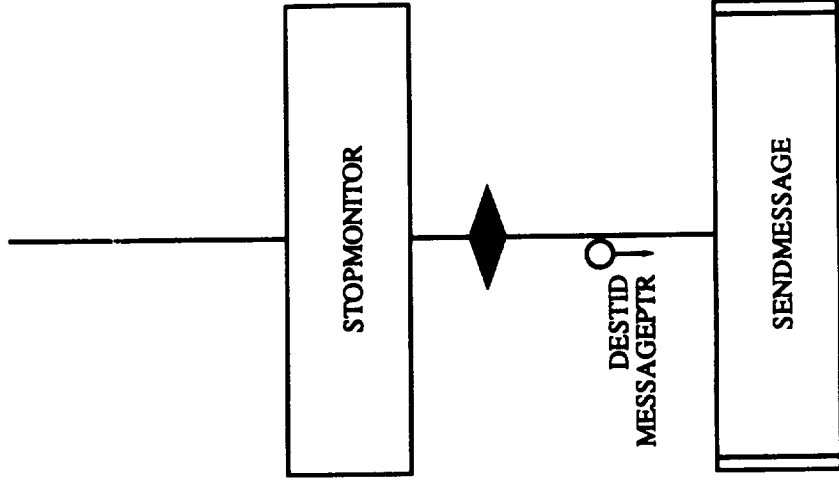


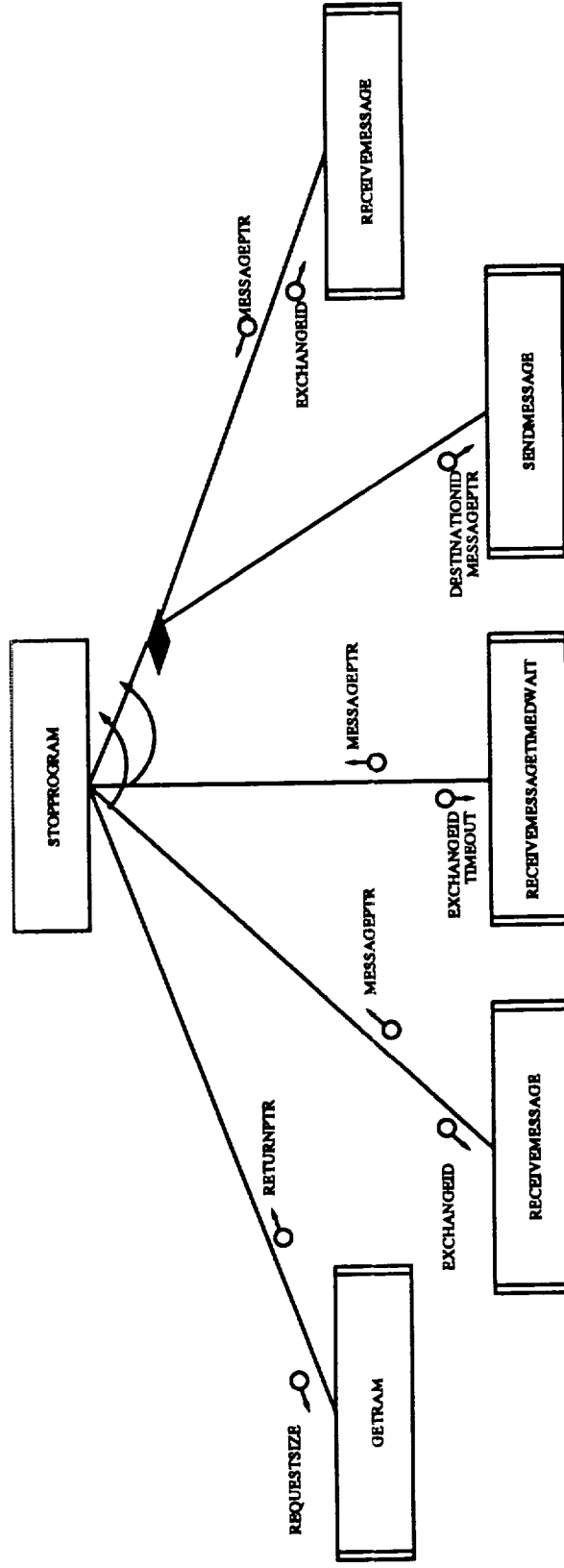


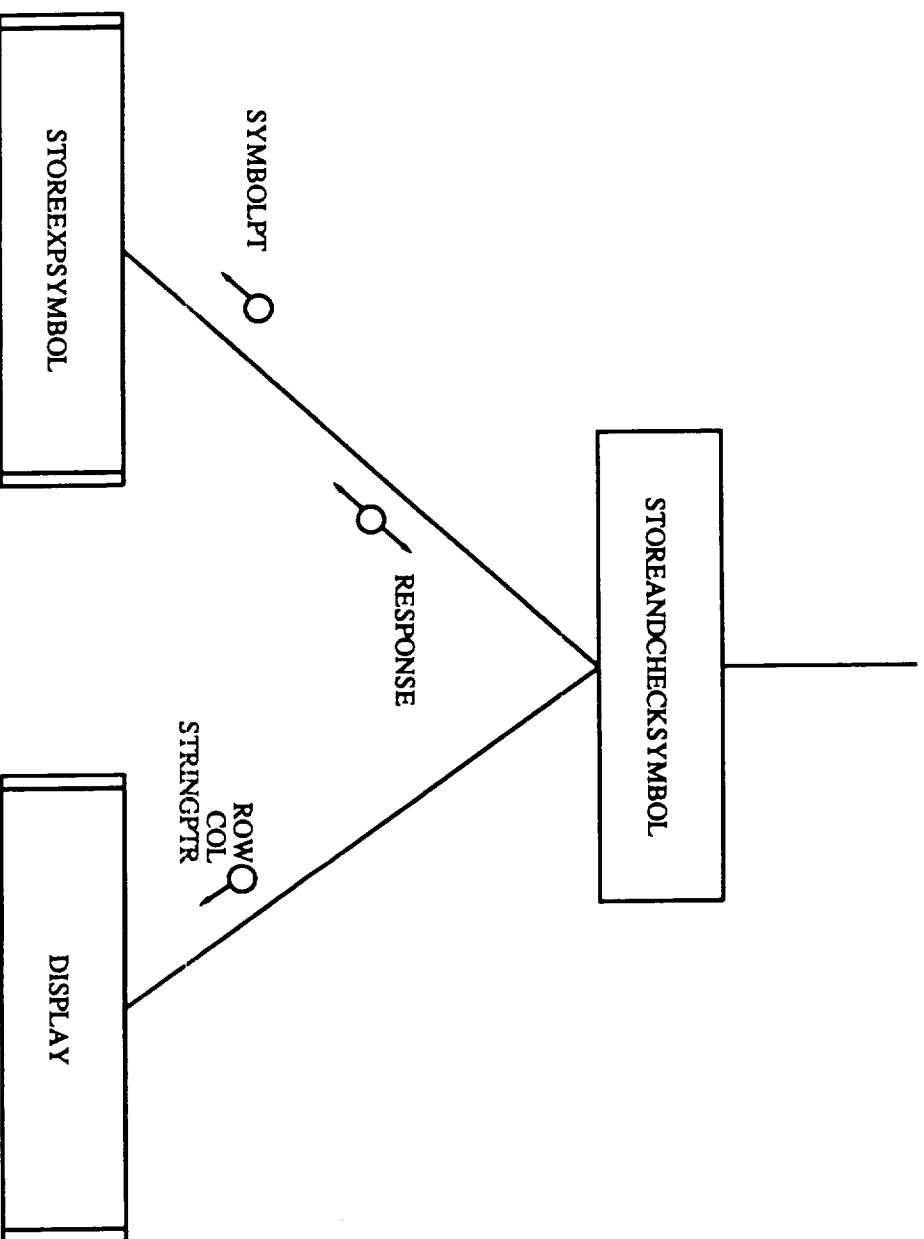
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DATABYTESIN
COMMAND

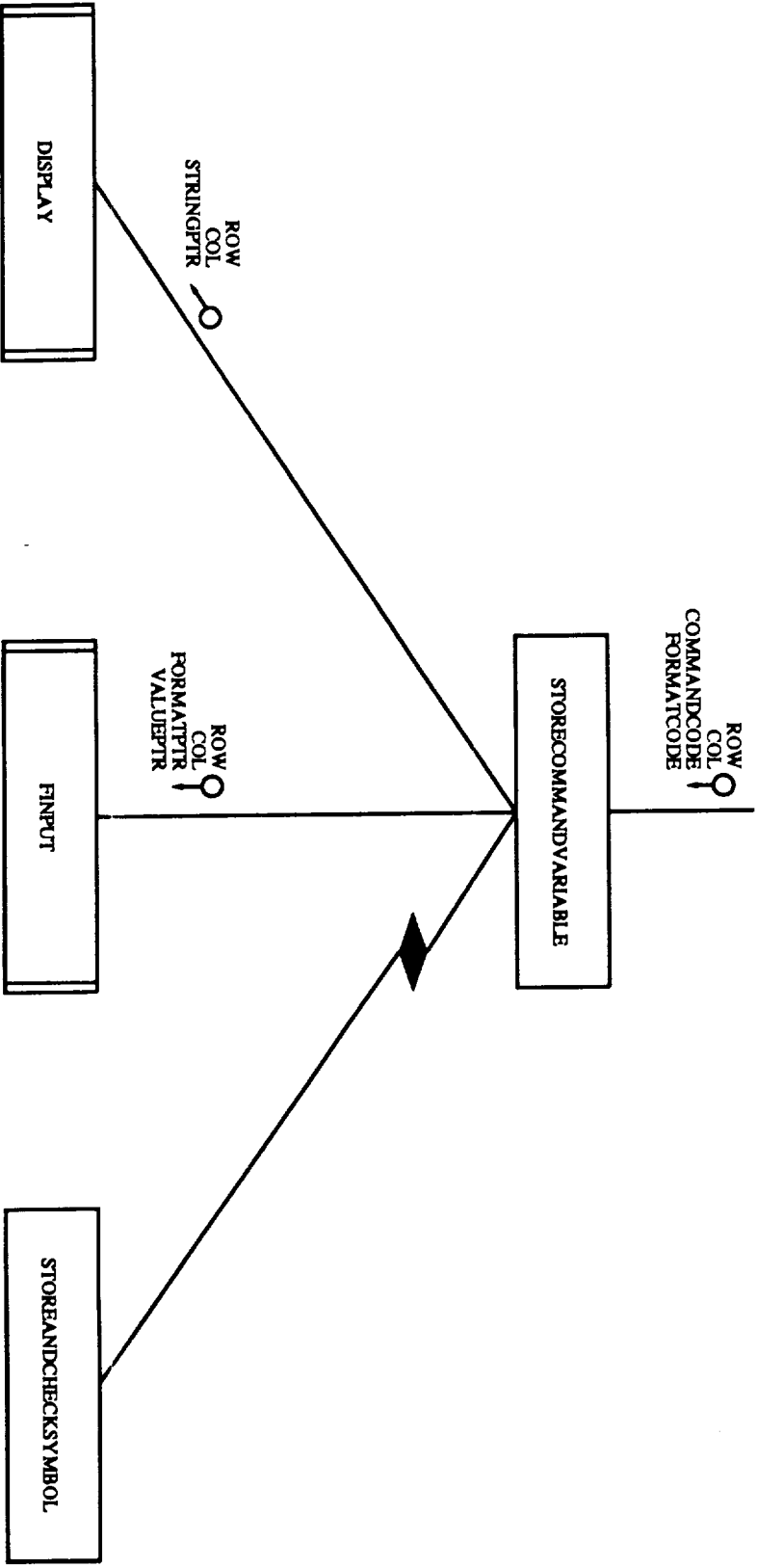
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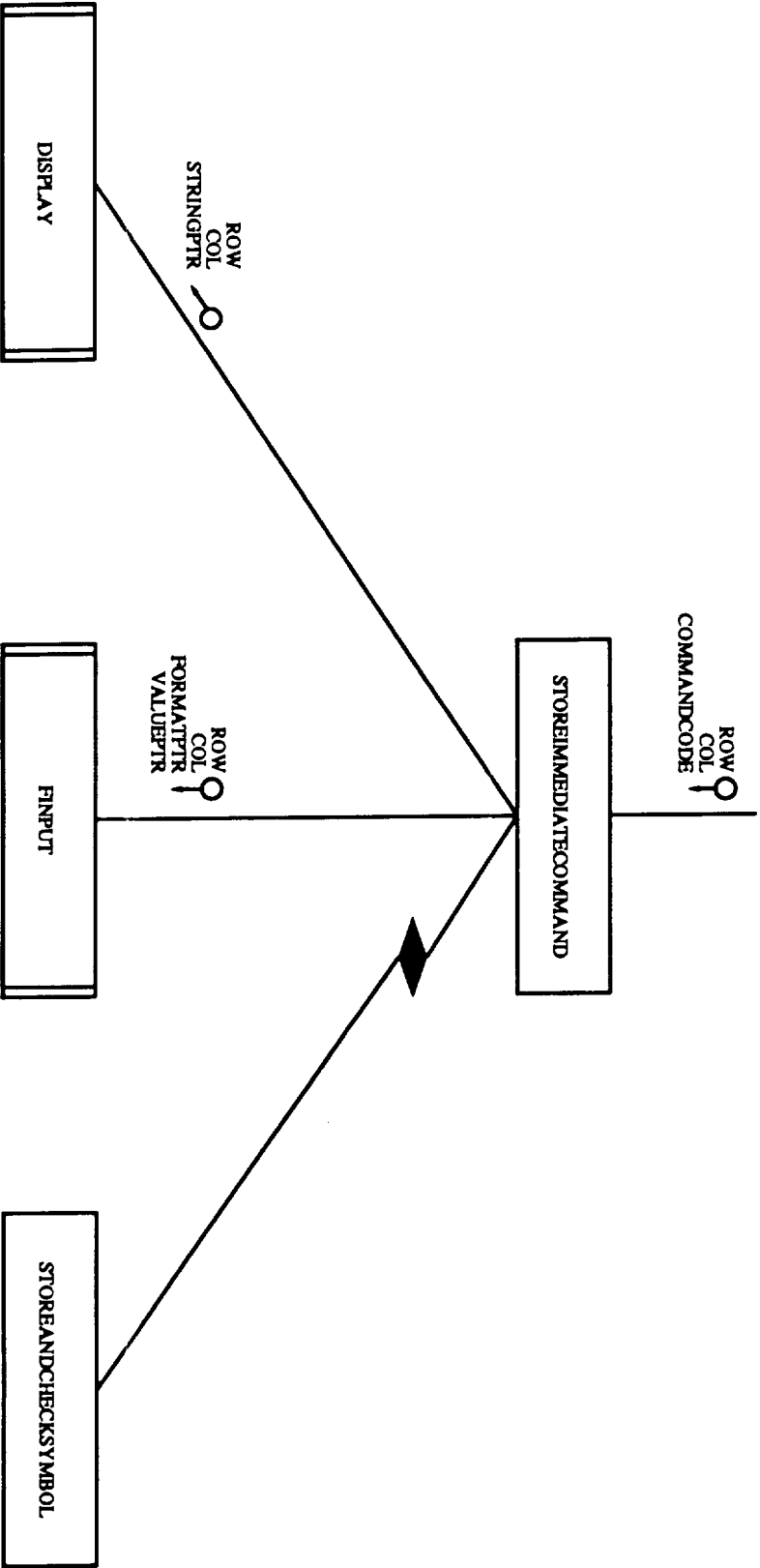


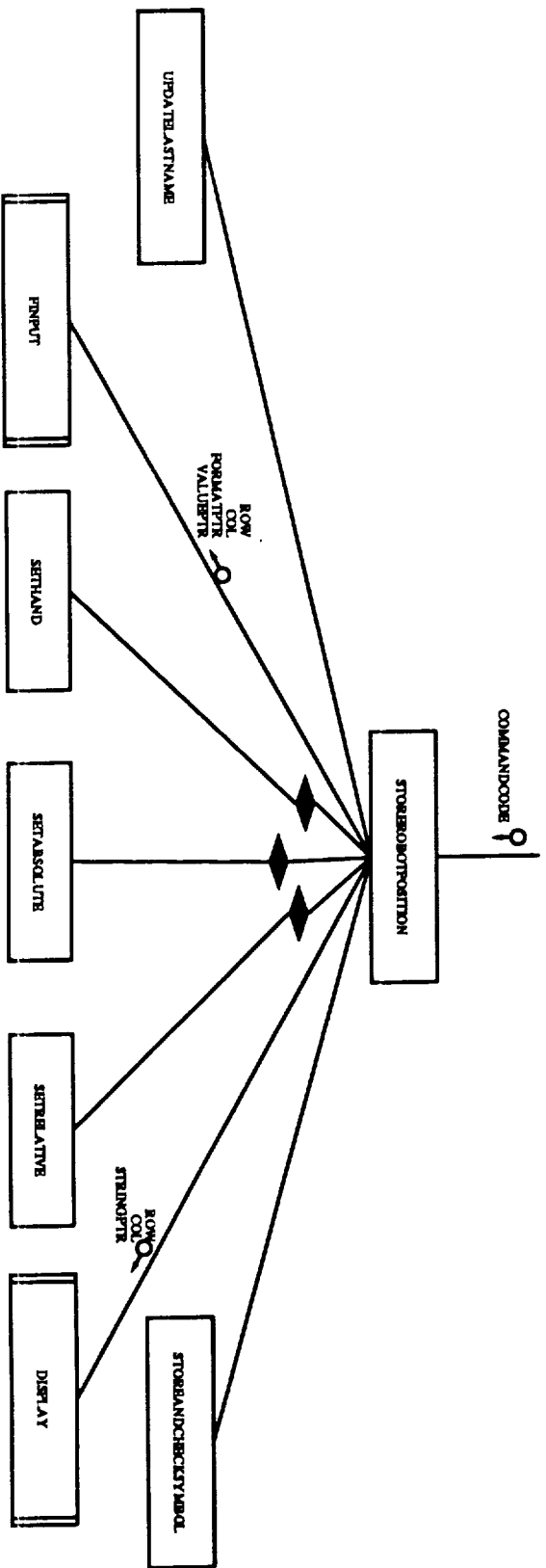


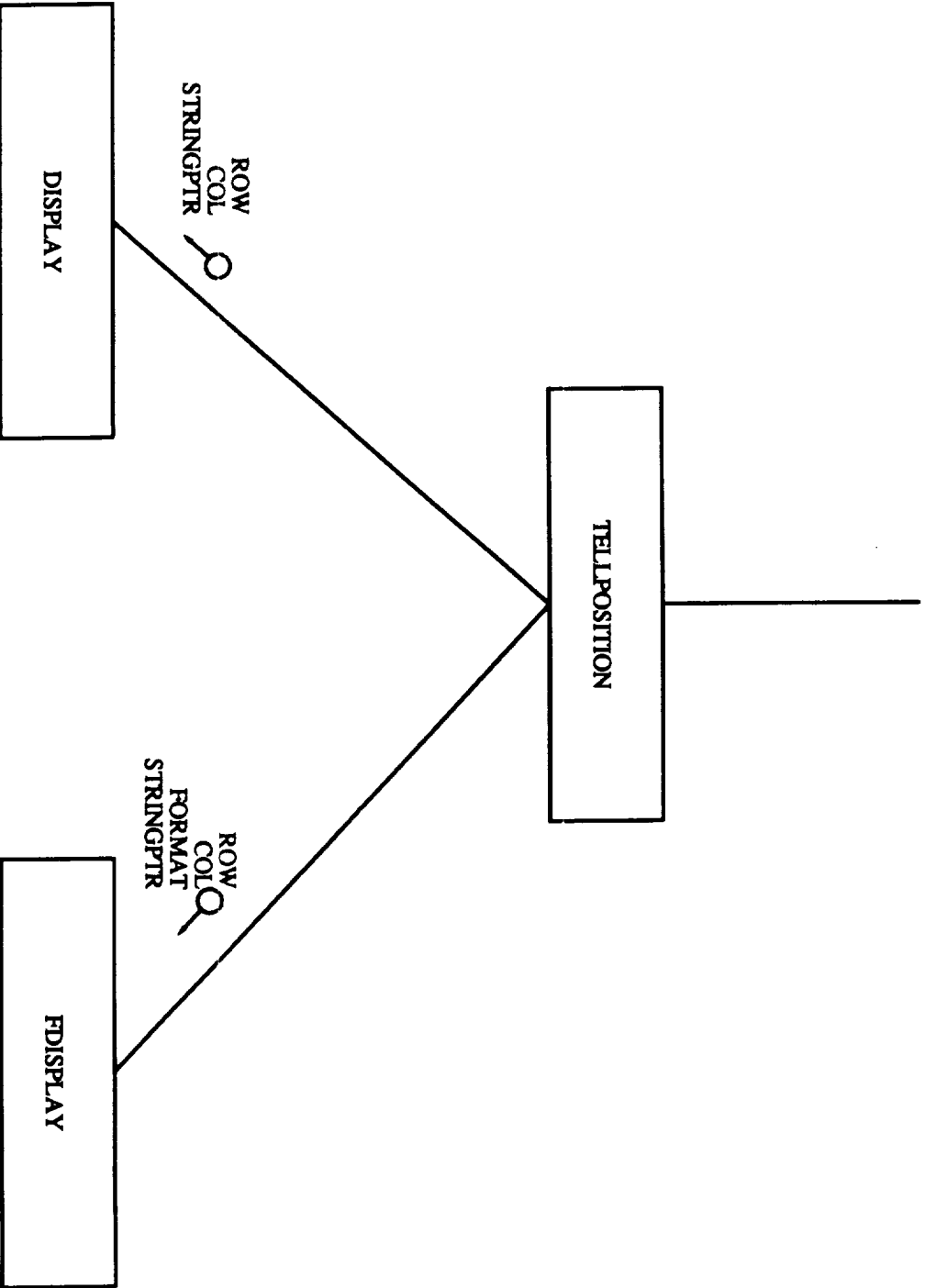


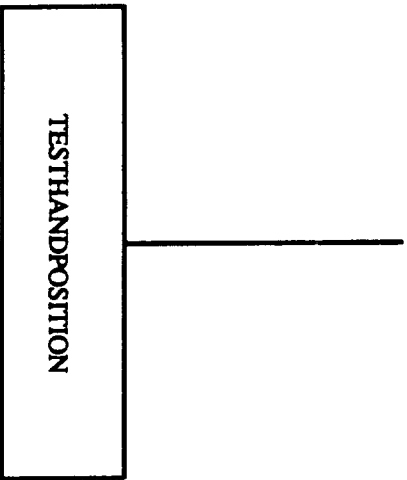


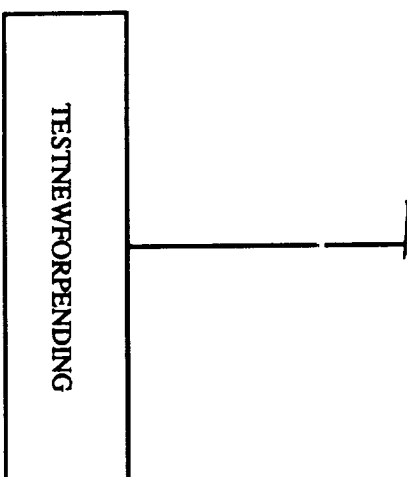


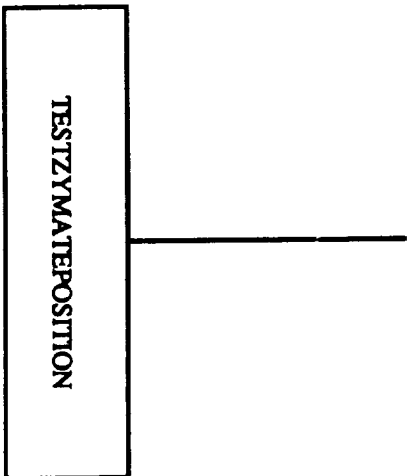


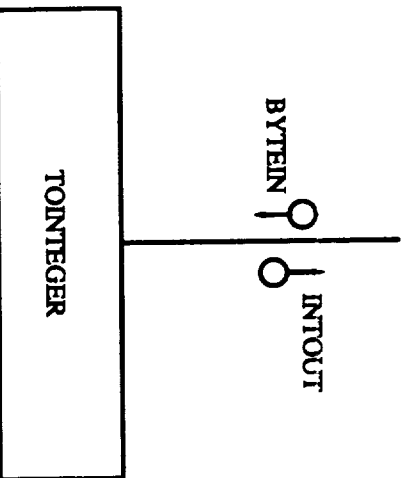


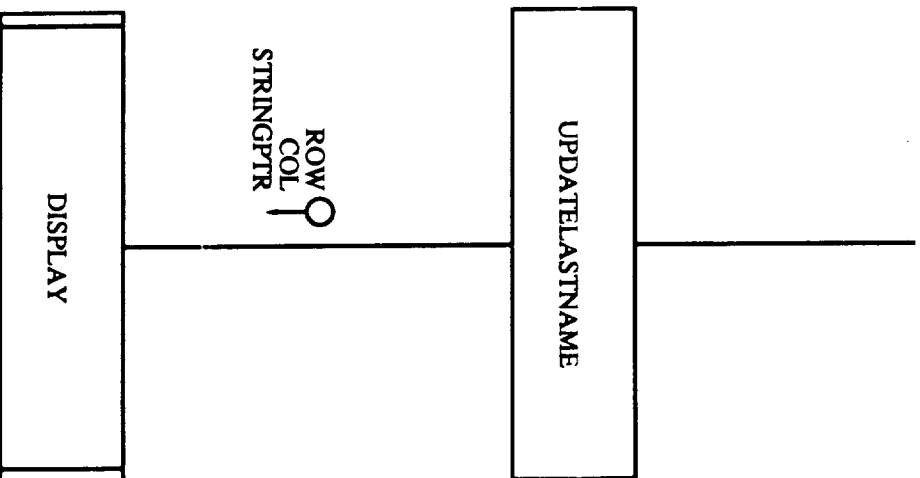


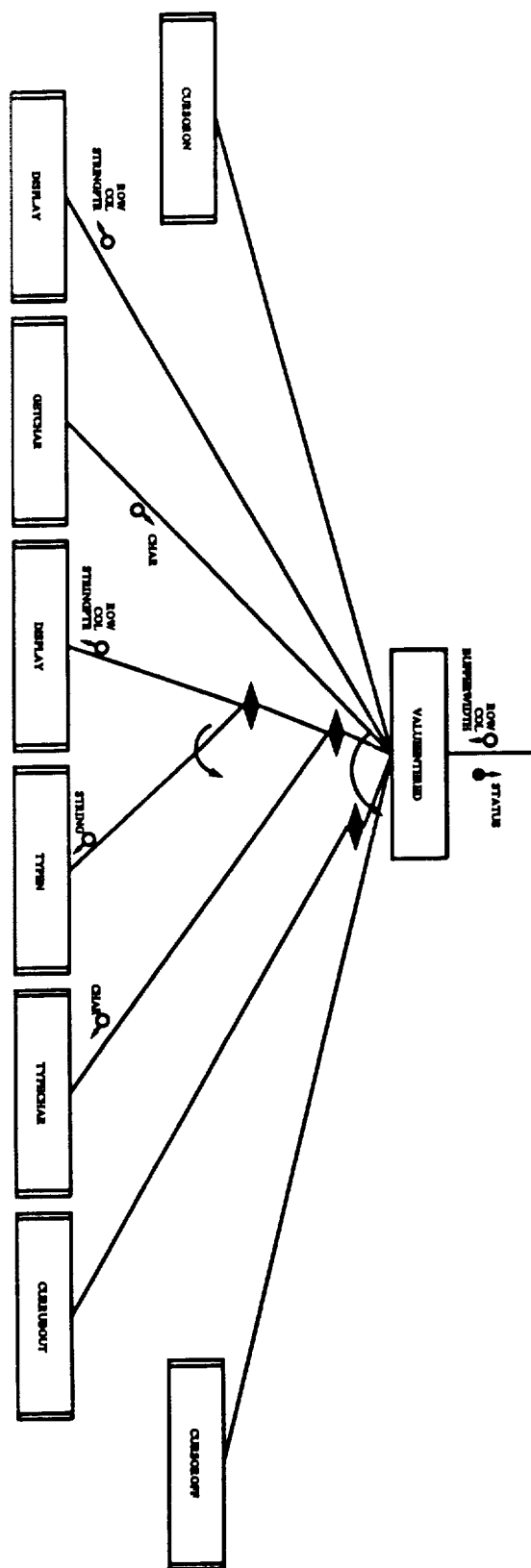


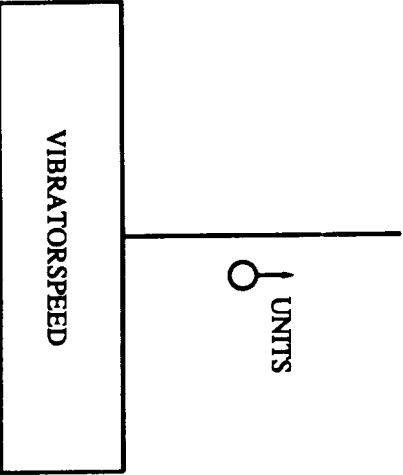


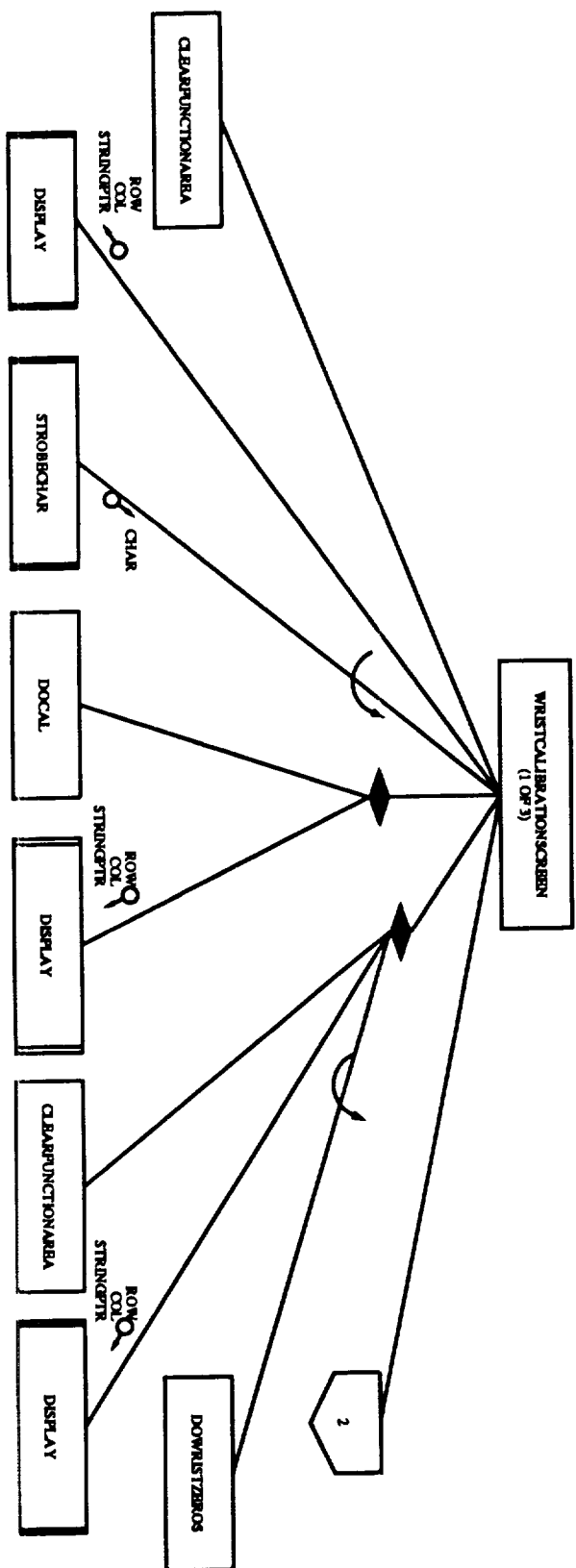


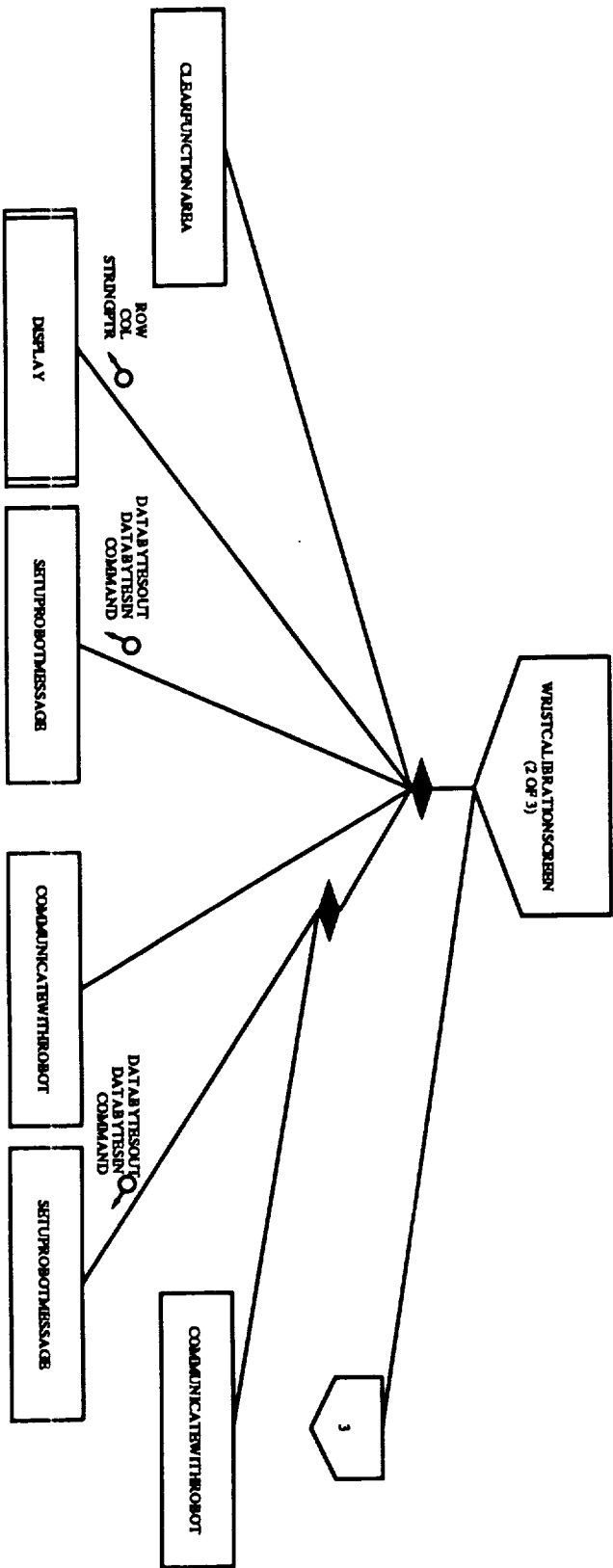


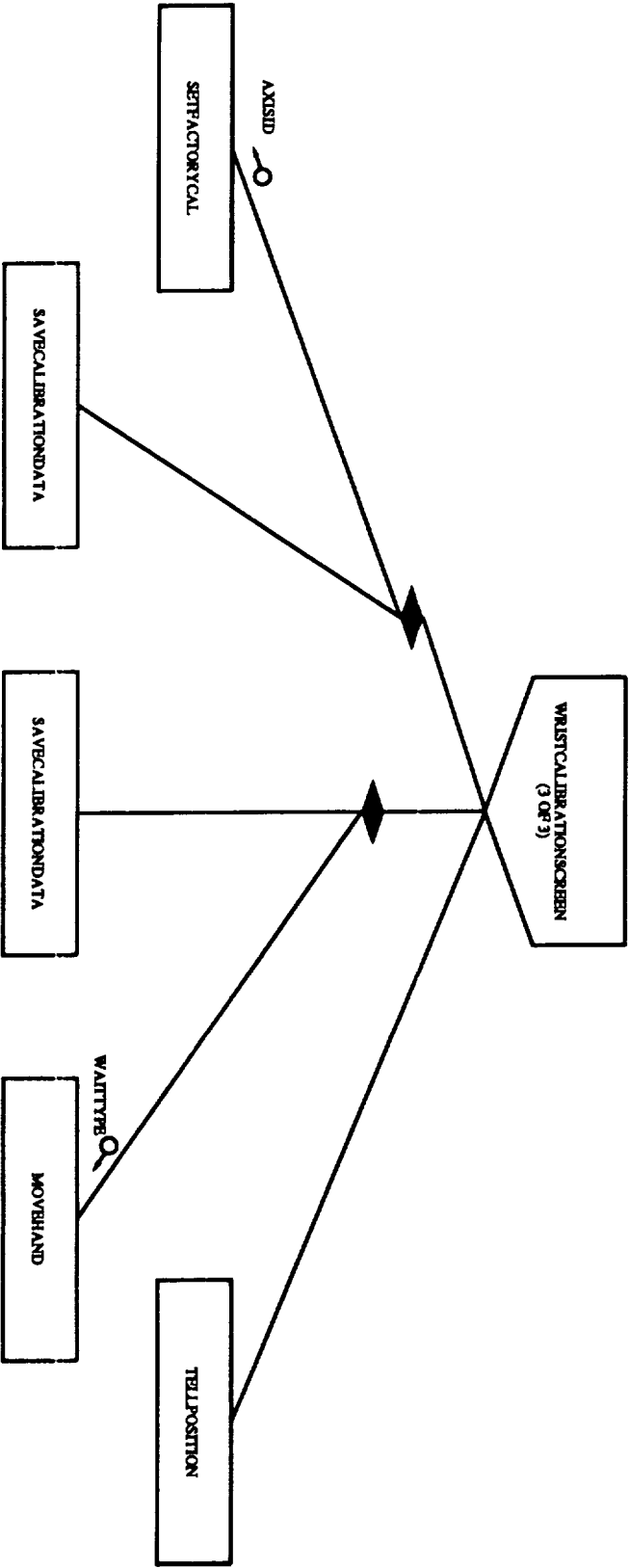


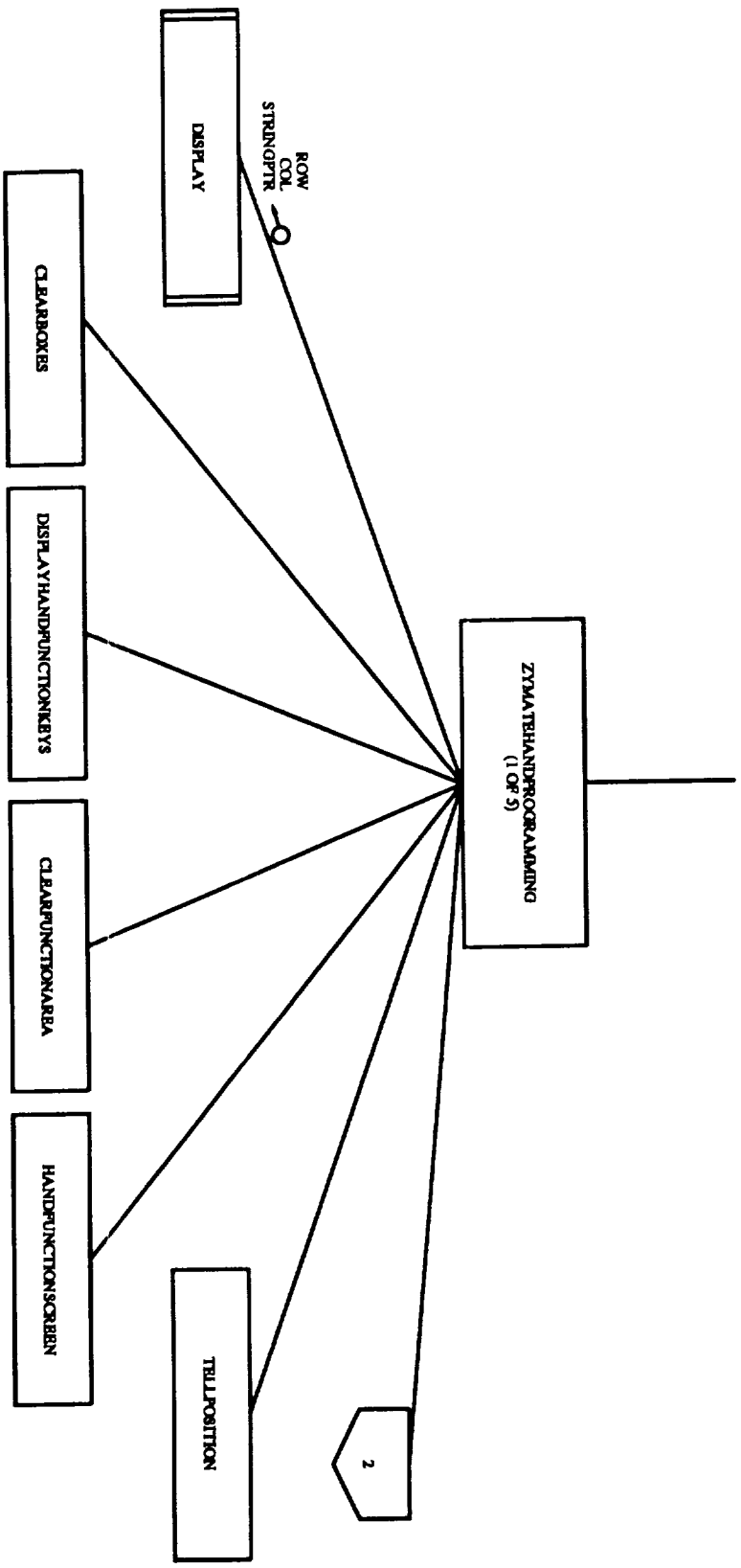


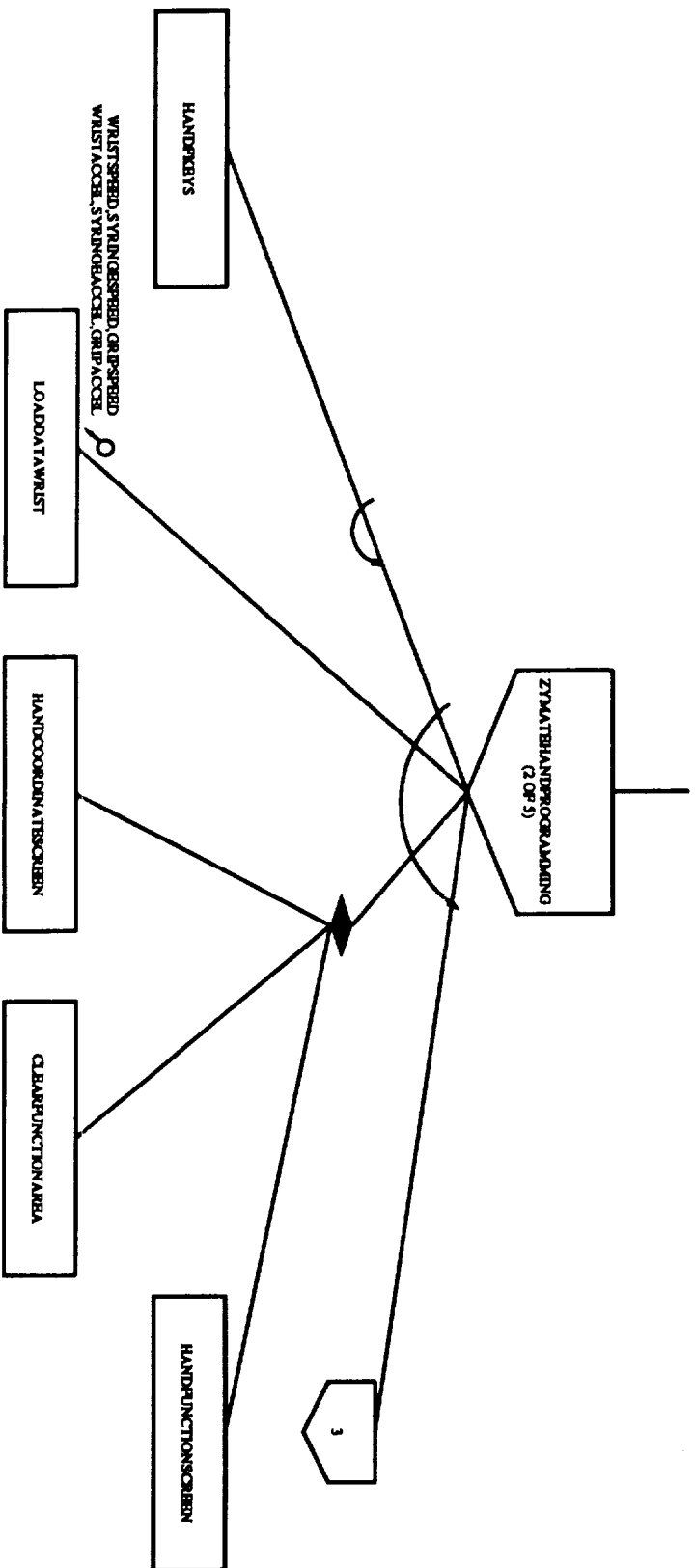


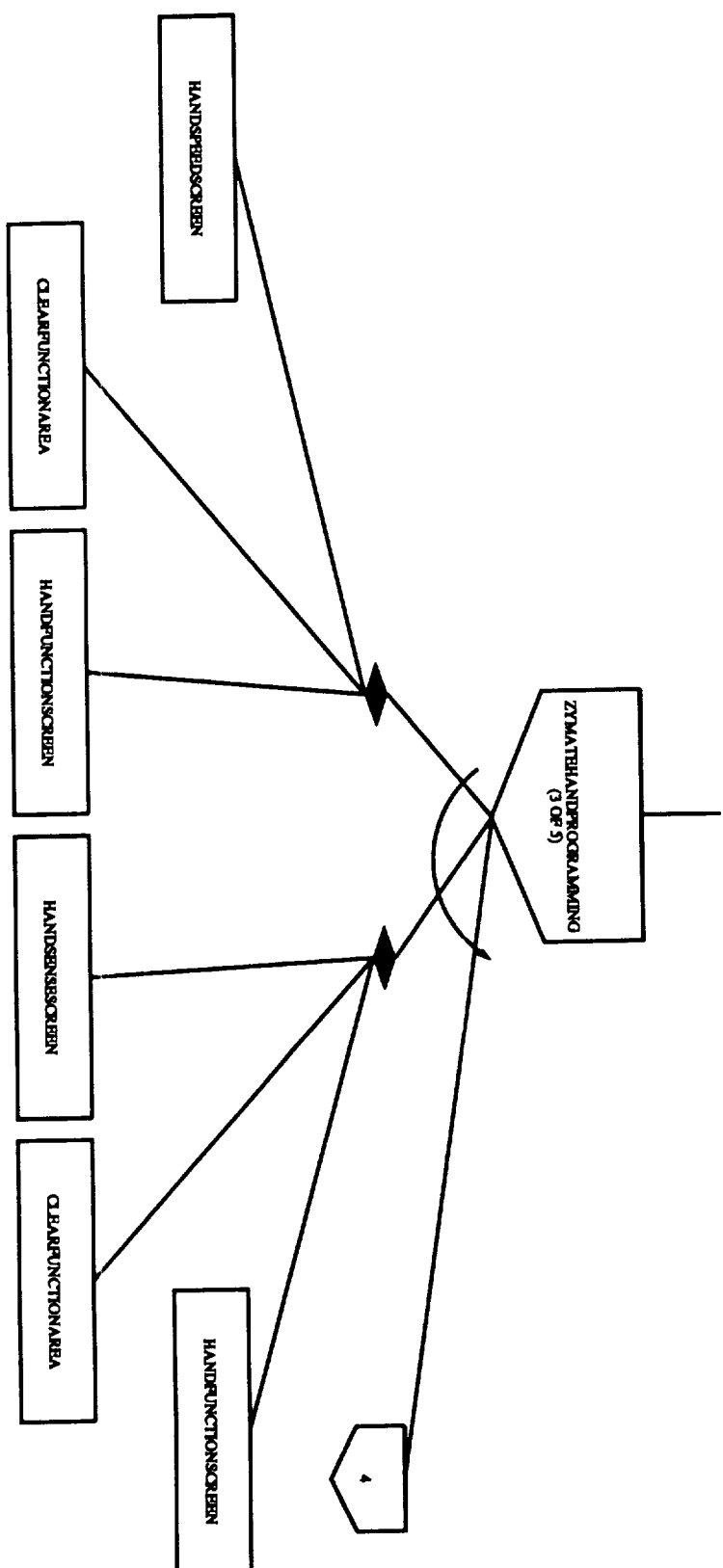


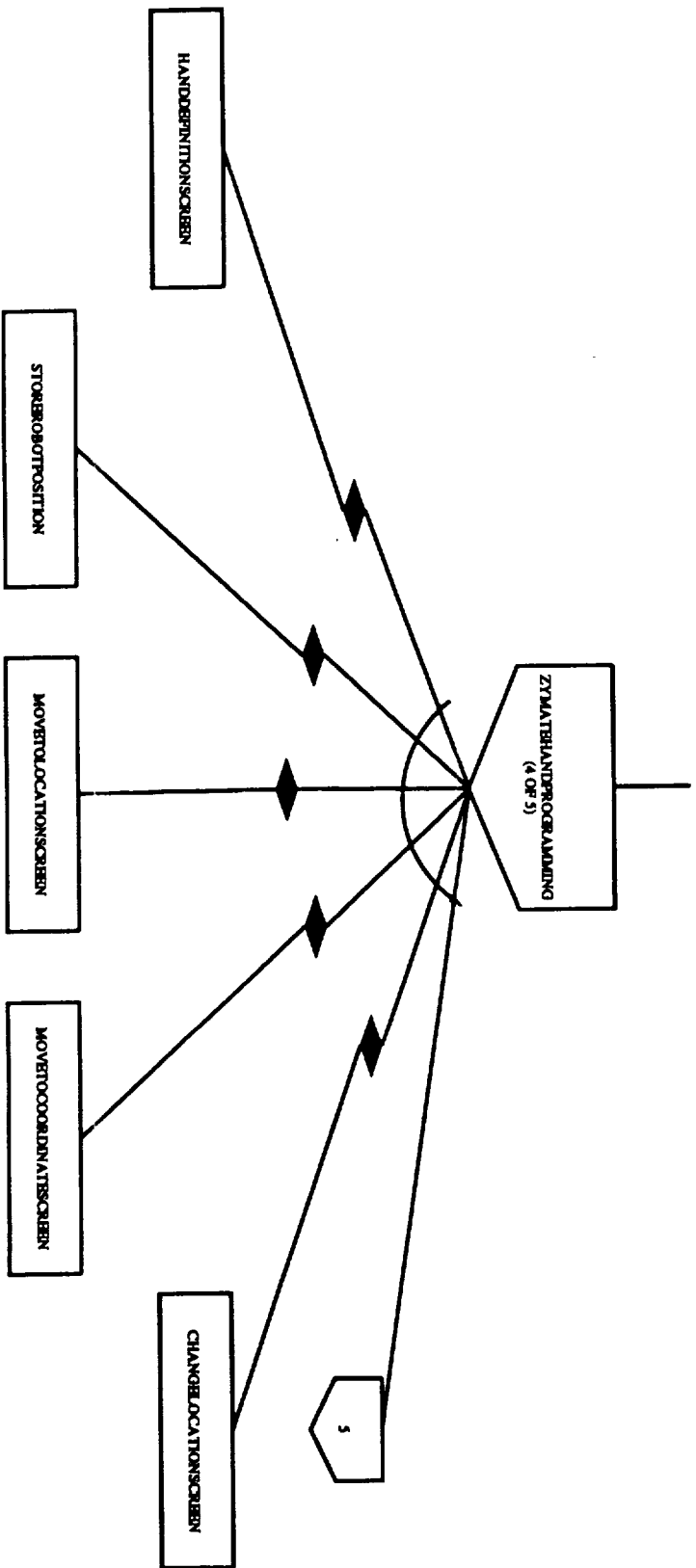


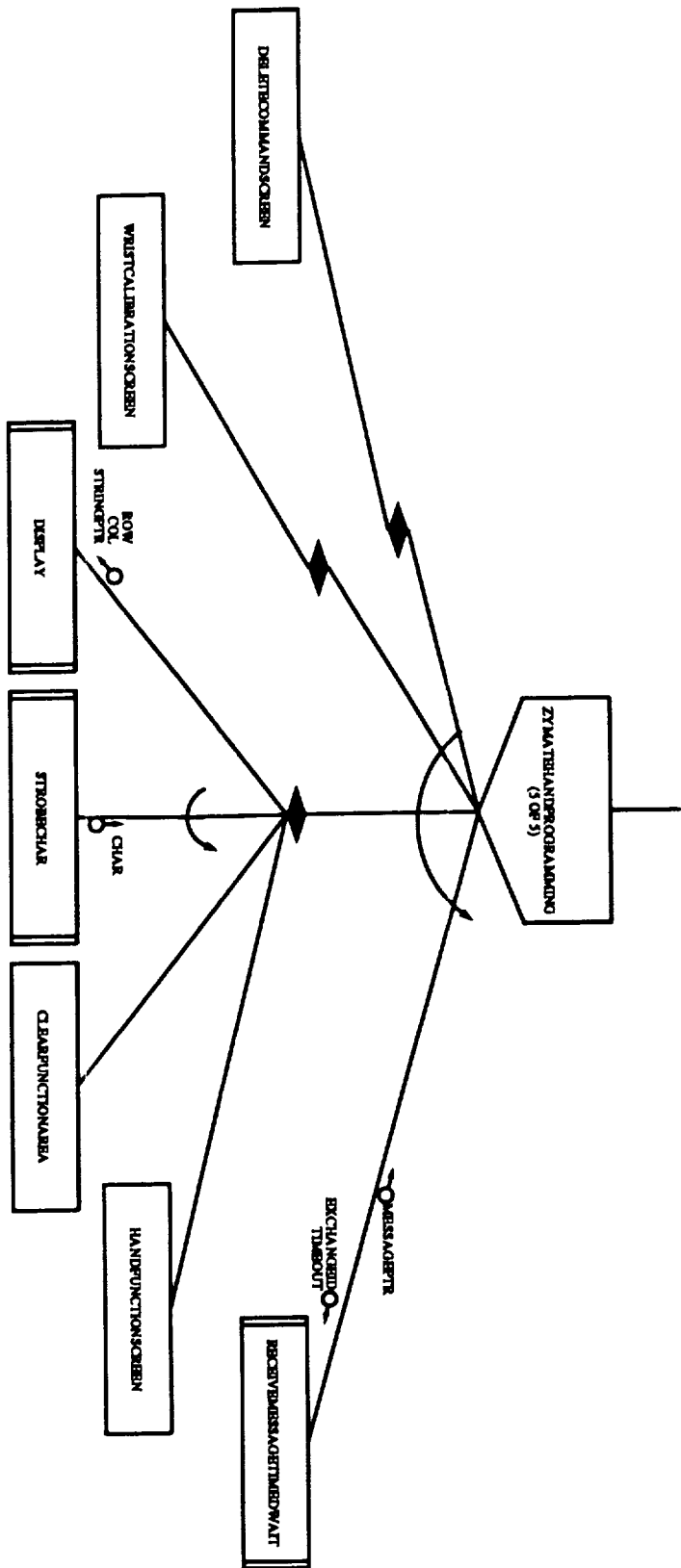


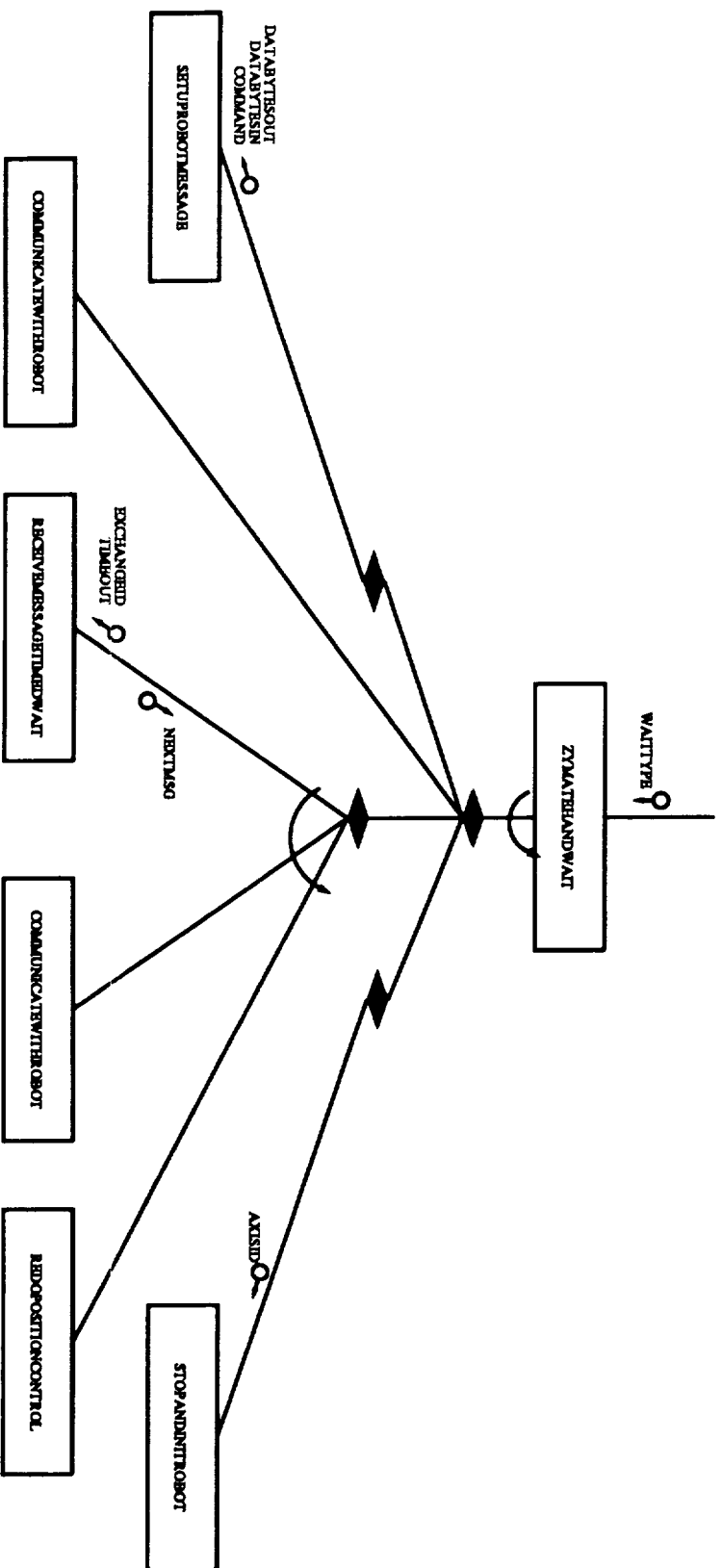


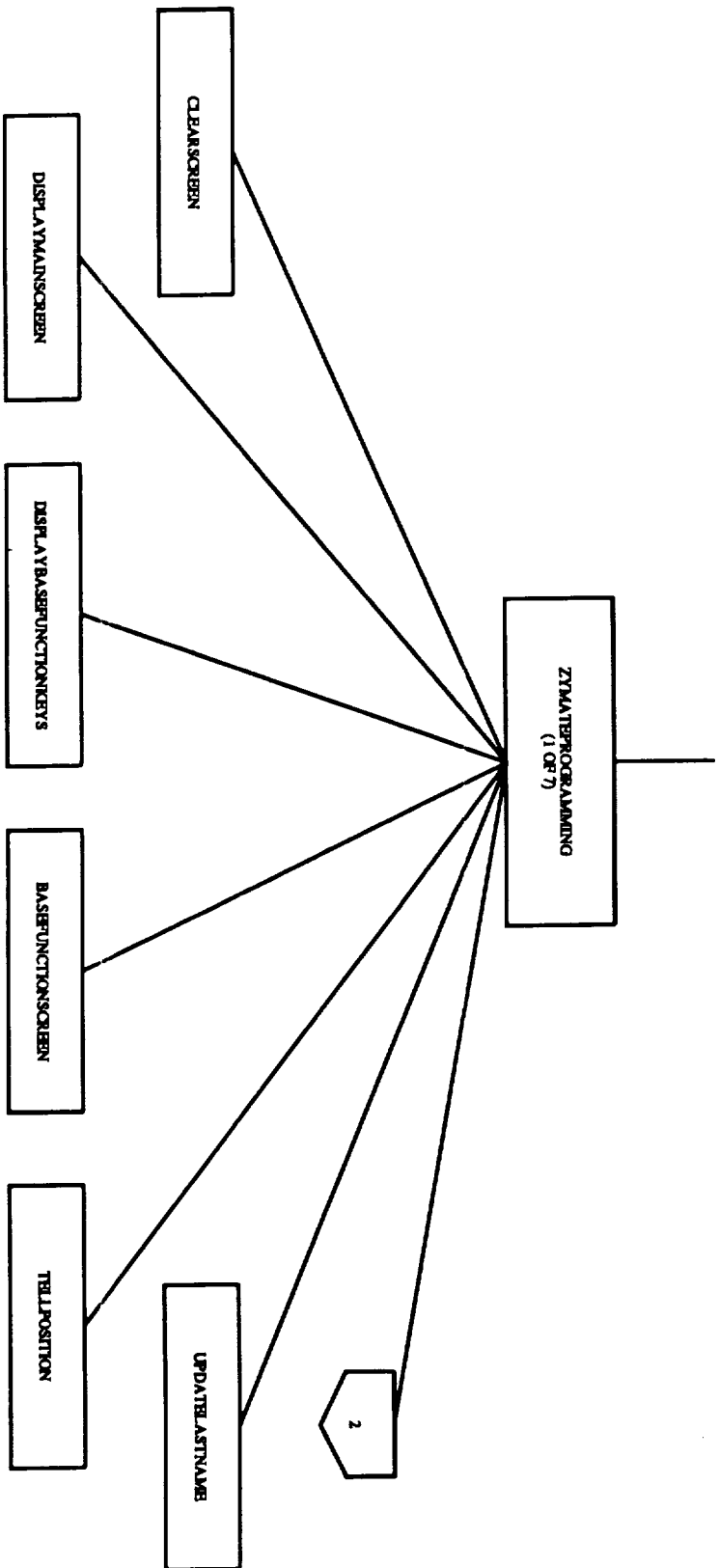


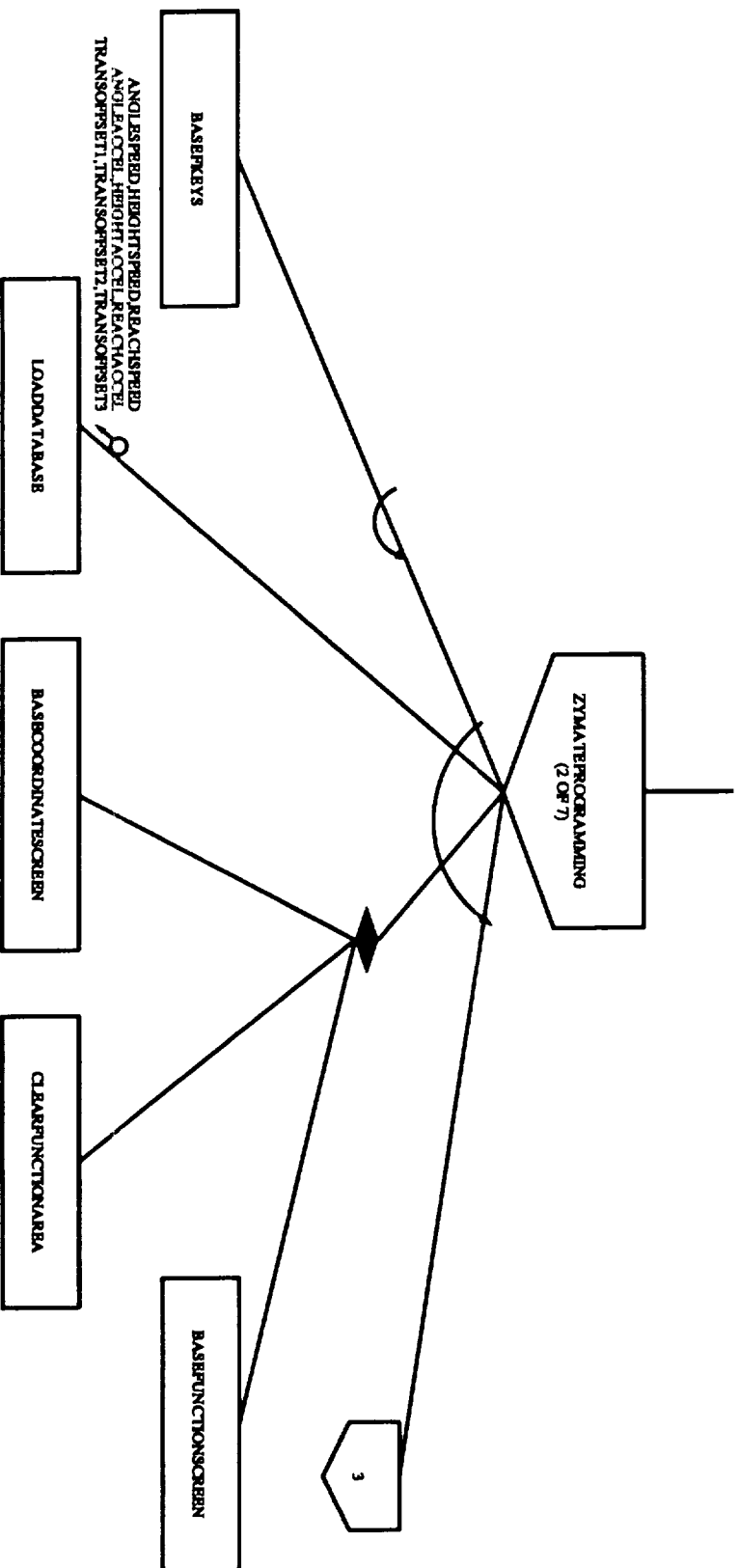


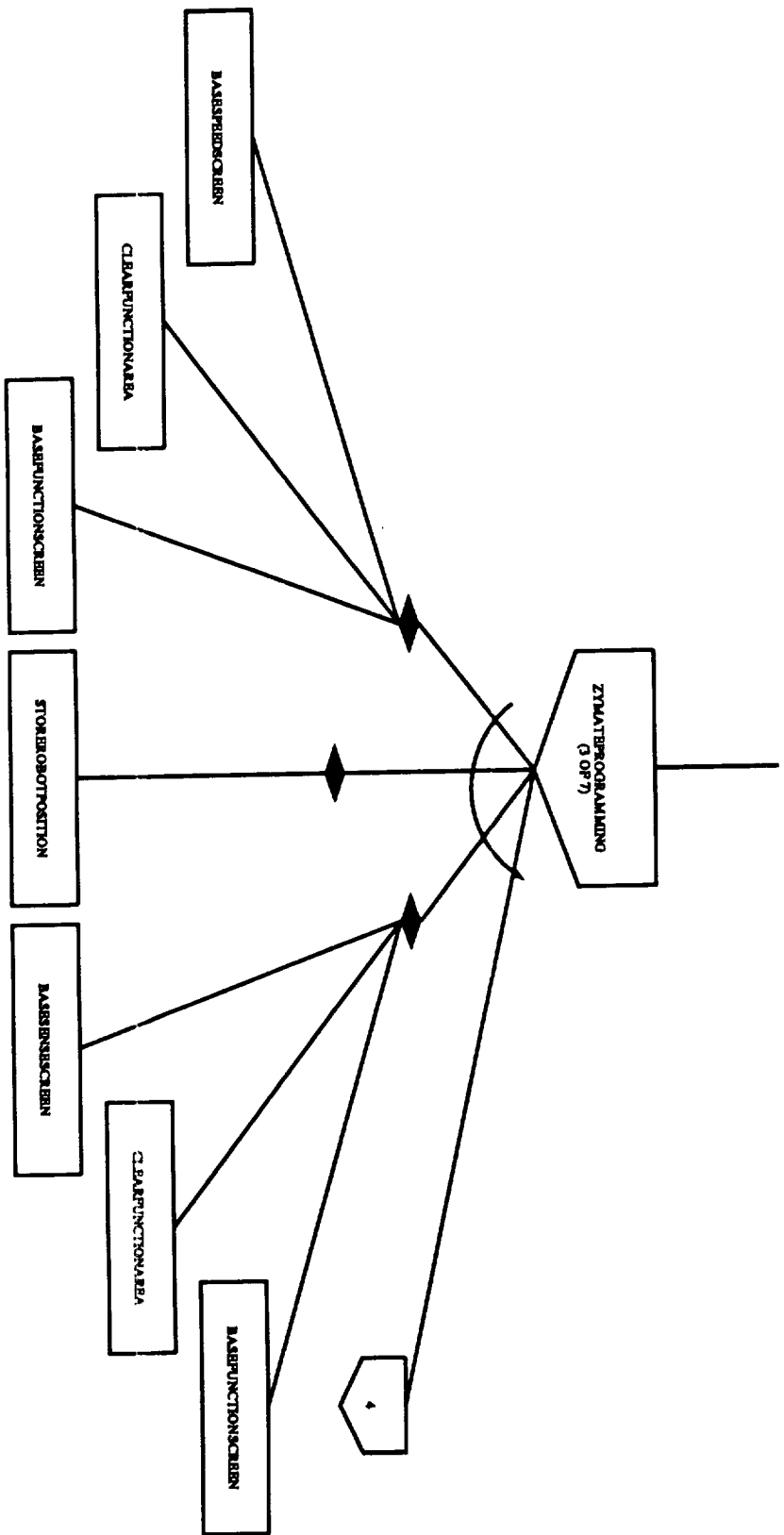


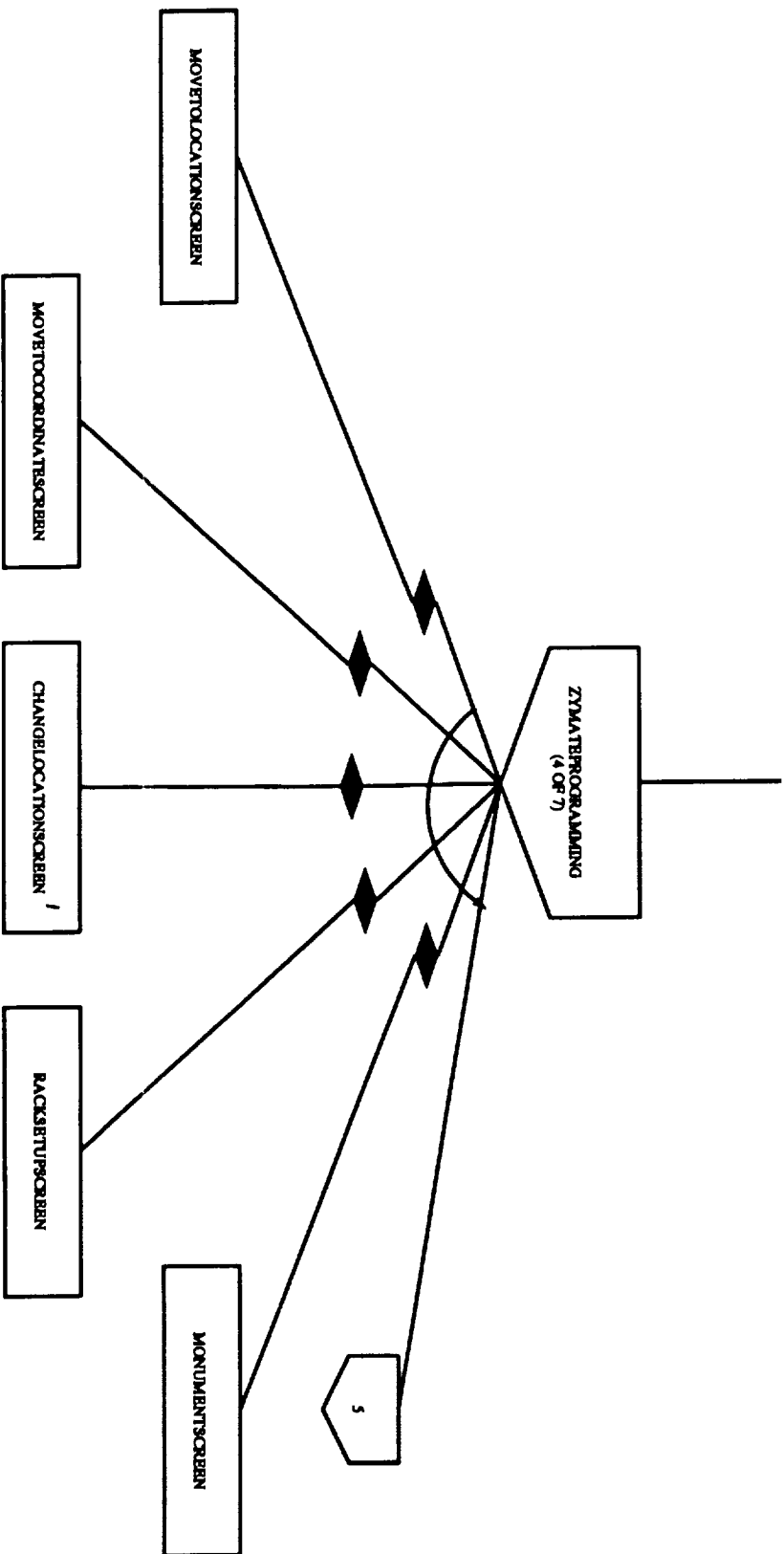


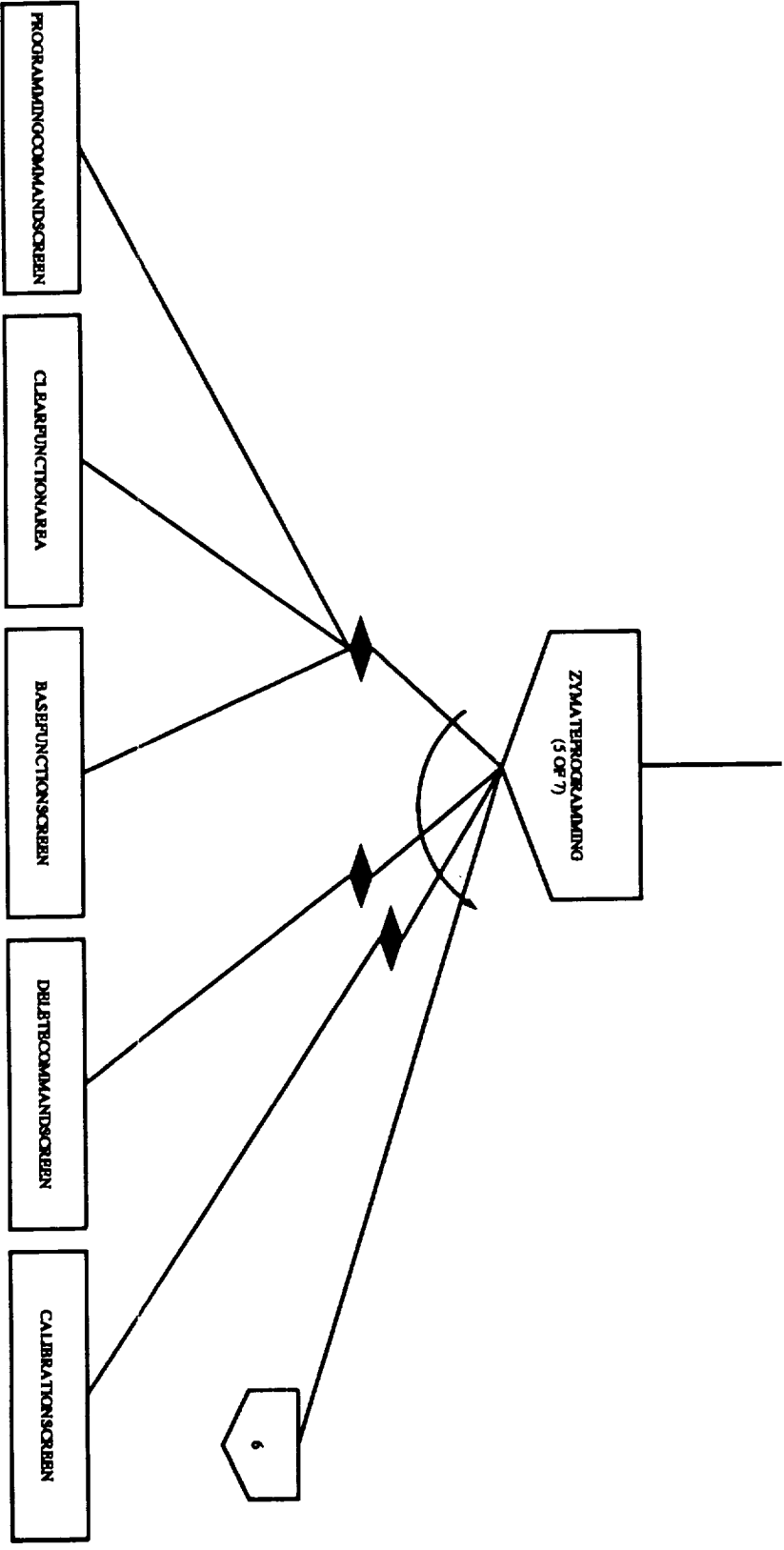


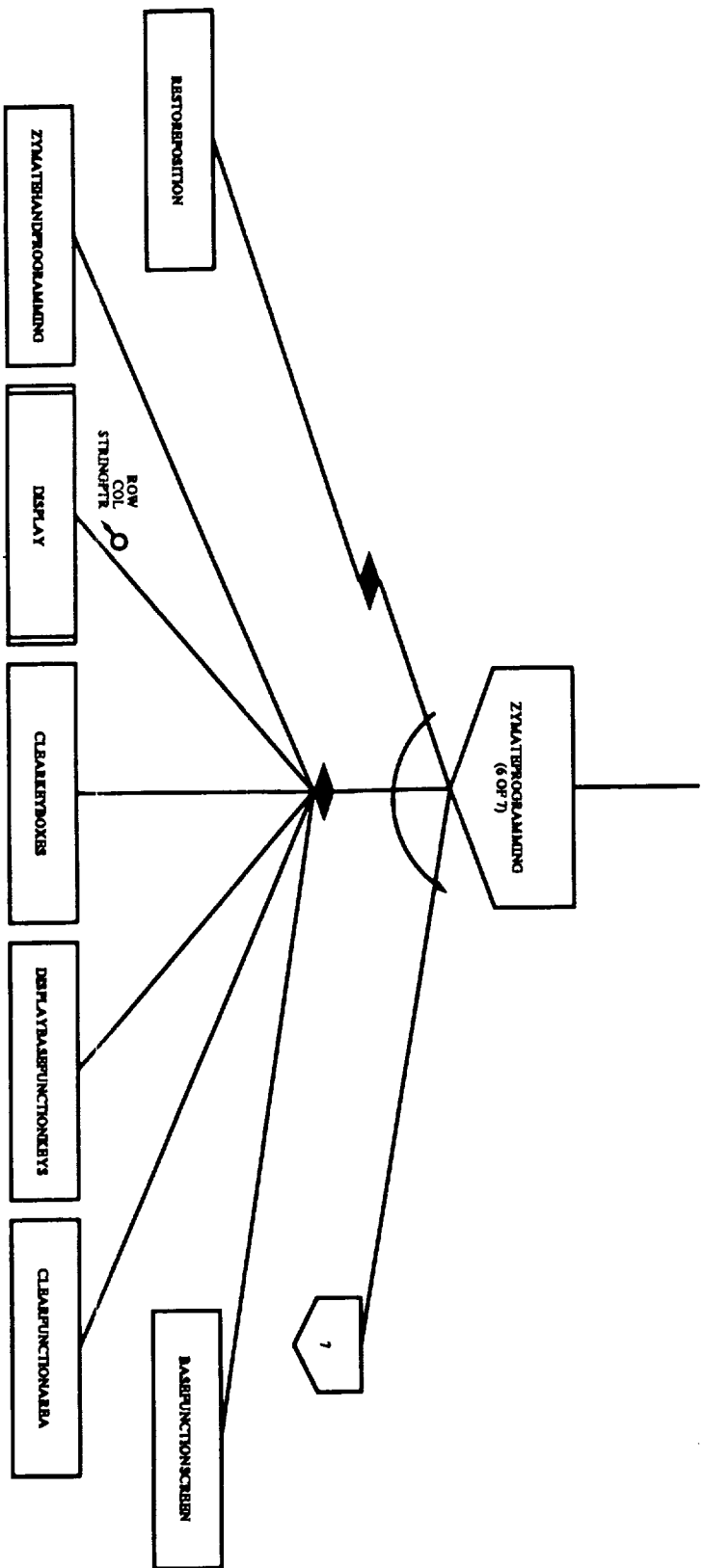


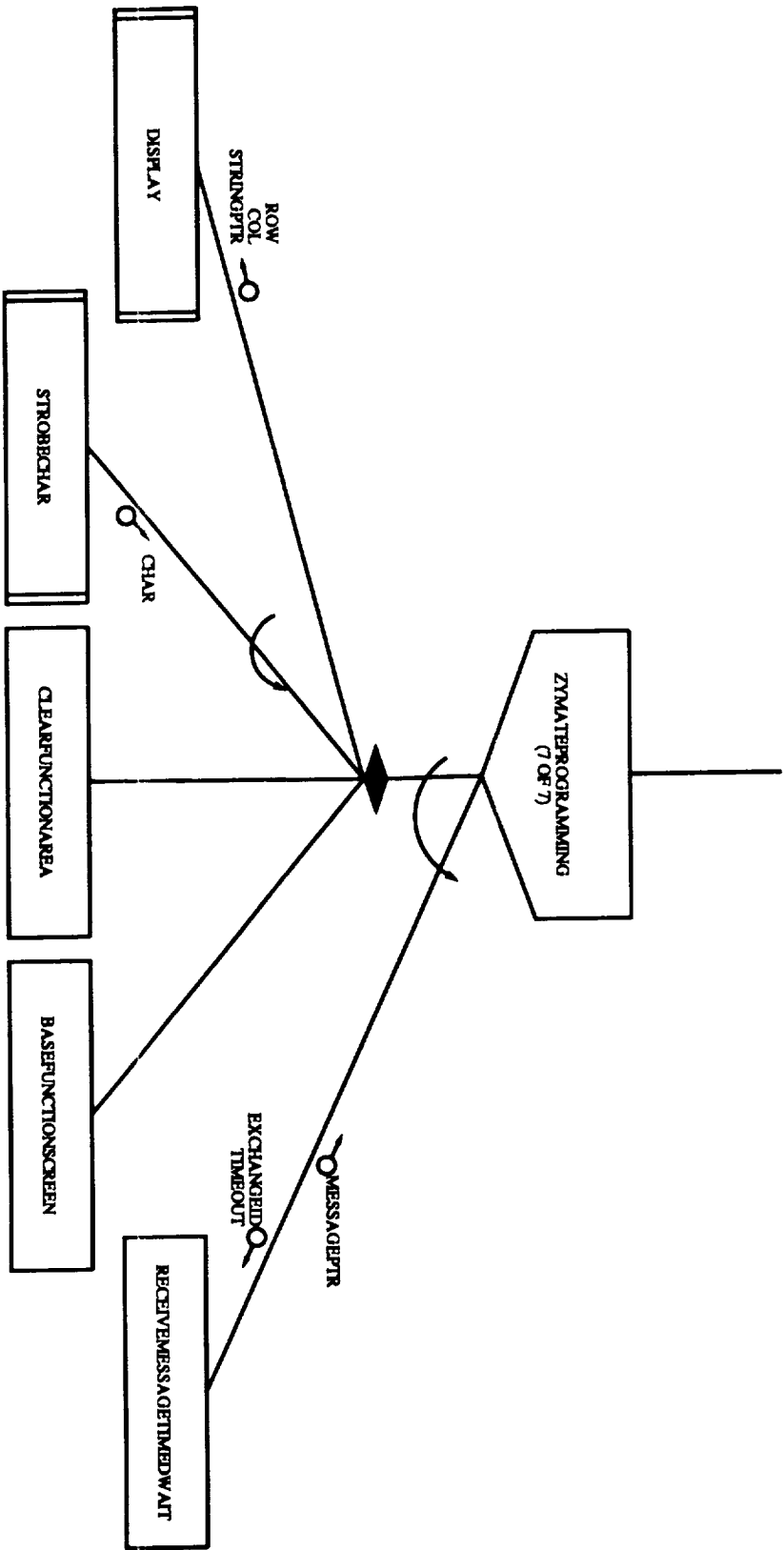


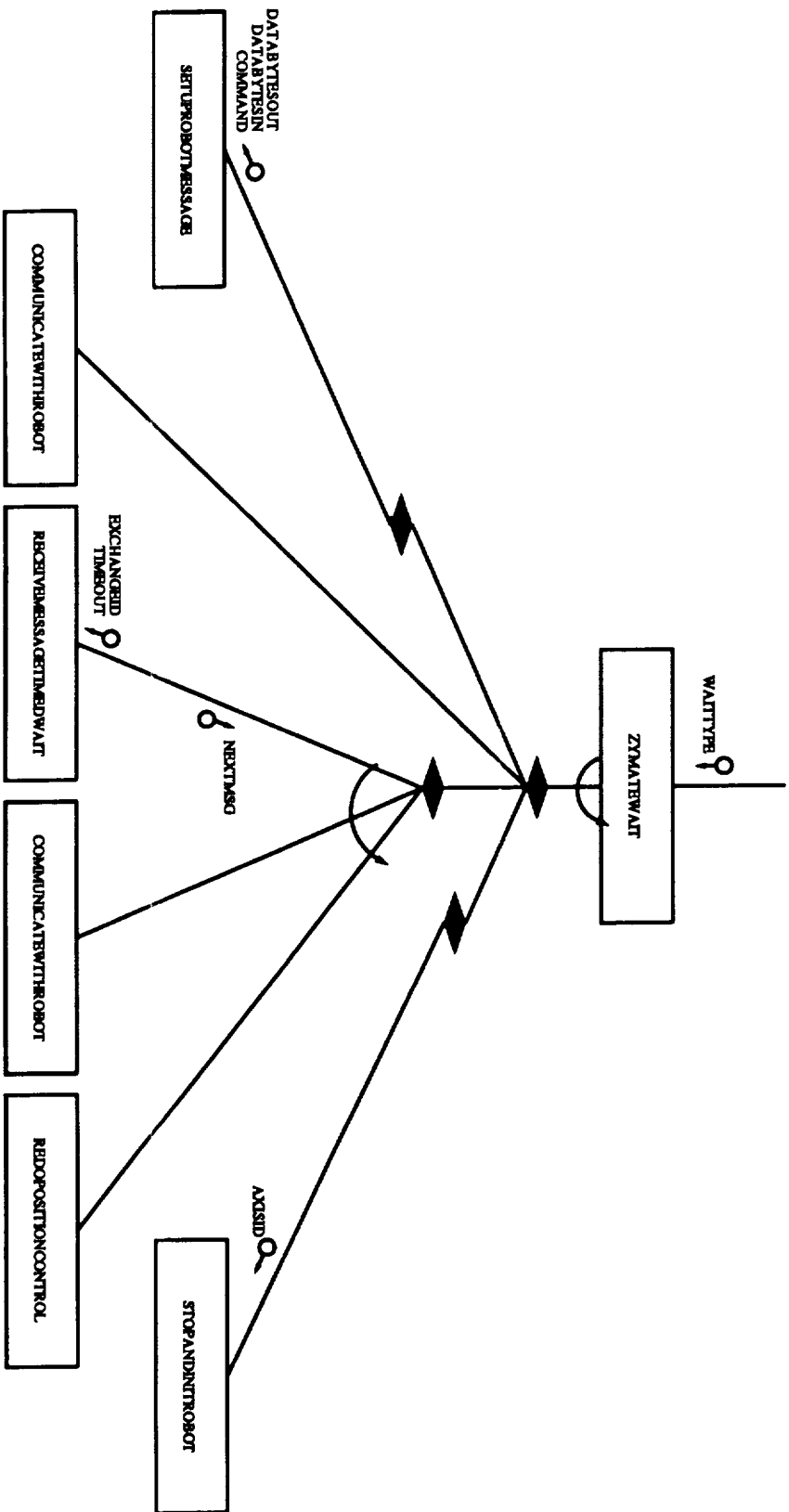












C-DOC FLOW STRUCTURE DIAGRAM

Defined Functions, SUMMARY Graphic TREES (of CALLER/CALLED flow Structure)

2346 ORCA1.CC	1	INITZYMATE
1331 ORCA2.CC	2	INITZYMATEROBOT
98 ORCA3.CC	3	RESETPROBOTMESSAGE
	4	..TIME
777 ORCA2.CC	5	GETCALIBRATIONDATA
139 ORCA3.CC	6	SETUPROBOTMESSAGE
	7	..SIZE
228 ORCA3.CC	8	COMMUNICATEWITHROBOT
192 ORCA3.CC	9	COMPUTECHECKSUM
152 ORCA3.CC	10	SENDMESSAGE TILL GOOD STATUS
98 ORCA3.CC	11	RESETPROBOTMESSAGE (3)
	12	..SENDMESSAGE RECEIVEMESSAGE CLEARSCREEN FDISPLAY DOUBLE RELEASE
206 ORCA3.CC	13	RETURNCHECKSUMOK
	14	..MOVW
825 ORCA2.CC	15	SETFACTORYCAL
533 ORCA3.CC	16	MOVEZYMATE
475 ORCA3.CC	17	CALCULATEBASEAXISCOUNTS
434 ORCA3.CC	18	TESTZYMATEPOSITION
	19	..DDIV DMUL DOUBLE UNSIGN LOW
ORCA3.CC	20	ZYMAWAIT
ORCA3.CC	21	SETUPROBOTMESSAGE (6)
ORCA3.CC	22	COMMUNICATEWITHROBOT (8)
308 ORCA3.CC	23	REDOPOSITIONCONTROL
139 ORCA3.CC	24	SETUPROBOTMESSAGE (6)
228 ORCA3.CC	25	COMMUNICATEWITHROBOT (8)
	26	..LOW HIGH
329 ORCA2.CC	27	STOPANDREINITROBOT
205 ORCA2.CC	28	DISPLAYCOLLISIONMESSAGE
	29	..DISPLAY TYPEN SHR
80 ORCA2.CC	30	GETPOSITION
139 ORCA3.CC	31	SETUPROBOTMESSAGE (6)
228 ORCA3.CC	32	COMMUNICATEWITHROBOT (8)
	33	..DDIV DOUBLE DMUL LOW SIGNED
970 ORCA3.CC	34	TELLPOSITION
	35	..DISPLAY UNSIGN SAR FDISPLAY IABS
329 ORCA2.CC	36	MOVEZYMATE (RECURSVE)
828 ORCA3.CC	37	MOVEHAND
750 ORCA3.CC	38	CALCULATEHANDAXISCOUNTS
687 ORCA3.CC	39	TESTHANDPOSITION
	40	..LOW DOUBLE DDIV DMUL UNSIGN IABS
767 ORCA3.CC	41	ZYMAHANDWAIT
139 ORCA3.CC	42	SETUPROBOTMESSAGE (6)
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828 ORCA3.CC	162	—MOVEHAND (37)
970 ORCA3.CC	163	—TELLPOSITION (34)
	164	..LAST DISPLAY FINPUT MOVB FINDSYMBOL ASCII TO REAL FIX FLOAT UNSIGN LOOKUPEXPSYMBOL SAL REAL TO ASCII NUMOUT FDISPLAY
1892 ORCA1.CC	165	—MOVETOCOORDINATESSCREEN
596 ORCA2.CC	166	—UPDATELASTNAME (82)
262 ORCA1.CC	167	—VALUEENTERED (134)
1857 ORCA1.CC	168	—RESTOREPOSITION
970 ORCA3.CC	169	—TELLPOSITION (34)
1870 ORCA1.CC	170	—GETSCALEDNR1
	171	..ASCII TO REAL FLOAT FIX
533 ORCA3.CC	172	—MOVEZYMATE (16)
828 ORCA3.CC	173	—MOVEHAND (37)
970 ORCA3.CC	174	—TELLPOSITION (34)
	175	..DISPLAY
1960 ORCA1.CC	176	—CHANGELOCATIONSCREEN
596 ORCA2.CC	177	—UPDATELASTNAME (82)
265 ORCA2.CC	178	—SETABSOLUTE (112)
ORCA2.CC	179	—SETRELATIVE (114)
ORCA2.CC	180	—SETHAND (110)
	181	..FINPUT LOOKUPEXPSYMBOL DISPLAY CHANGEEXPSYMBOL TYPEN
991 ORCA2.CC	182	—RACKSETUPSCREEN
212 ORCA1.CC	183	—CLEARFUNCTIONAREA (94)
596 ORCA2.CC	184	—UPDATELASTNAME (82)
881 ORCA2.CC	185	—DISPLAYCURRENTHAND (143)
394 ORCA2.CC	186	—FORCEUPPER (71)
891 ORCA2.CC	187	—GETDICTIONARYHANDOFFSETS (159)
484 ORCA3.CC	188	—LOADDATABASE (55)
857 ORCA2.CC	189	—MOVEZYMATE TILLACKNOWLEDGE
409 ORCA2.CC	190	—BASEFKEYS (84)
484 ORCA3.CC	191	—LOADDATABASE (55)
899 ORCA2.CC	192	—MOVETORACKINDEX (145)
970 ORCA3.CC	193	—TELLPOSITION (34)
533 ORCA3.CC	194	—MOVEZYMATE (16)
	195	..GETRAM DISPLAY FINPUT LOOKUPEXPSYMBOL GETCHAR LAST MOV B FDISPLAY FLOAT SQRT ATAN COS SIN SIGNED SIZE STOREEXPSYMBOL CHANGEEXPSYMBOL FREERAM
547 ORCA1.CC	196	—MONUMENTSCREEN
212 ORCA1.CC	197	—CLEARFUNCTIONAREA (94)
225 ORCA1.CC	198	—CLEARNAMEAREA
	199	..DISPLAY LAST
596 ORCA2.CC	200	—UPDATELASTNAME (82)
394 ORCA2.CC	201	—FORCEUPPER (71)
857 ORCA2.CC	202	—MOVEZYMATE TILLACKNOWLEDGE (189)
265 ORCA2.CC	203	—SETABSOLUTE (112)
	204	..LAST DISPLAY LOW HIGH LOOKUPEXPSYMBOL FINDSYMBOL DELETEEXPSYMBOL FDISPLAY GETCHAR TYPECHAR FINPUT SIZE STOREEXPSYMBOL CHANGEEXPSYMBOL MOV B
771 ORCA1.CC	205	—PROGRAMMINGCOMMANDSCREEN
ORCA1.CC	206	—CLEARFUNCTIONAREA (94)
ORCA2.CC	207	—BASEFKEYS (84)
717 ORCA2.CC	208	—STOREIMMEDIATECOMMAND
671 ORCA2.CC	209	—STOREANDCHECKSYMBOL (98)
	210	..DISPLAY LAST FINPUT SIZE

**C-DOC
FUNCTION COMMENT BLOCK**

Function COMMENT-BLOCK (of USERS/CALLS and LOCALS/GLOBALS)

(null)	START: 1 ORCA1.CC	
DEFIN: BYTEDATA	COMMAND	COMMANDENTRY
COMMANDMSG	COMMANDVARIABLE	HANDCOMMAND
HANDGEOMETRY	IMMEDIATECOMMAND	MAXTRIES
MODULE	MODULEDATA	MOVEWAIT
NORMALWAIT	PARM	RACKCOMMAND
RACKCOMMANDENTRY	RACKINDEX	REALDATA
RETURNDATA	TIMER0	TIMER1
TIMER2	TIMERCMD	UARTOFFSET
VARIABLECOMMAND	VARIABLEDATA	WORDDATA
WORKINGRAMSIZE	ZYMATEPLACE	
GLOBAL: ..COMMAND	..COMMANDCODE	..DESTINATIONID
..EXCHANGEID	..EXCHANGELINK	..HOMEID
..LENGTH	..LINK	..MESSAGEHEAD
..MESSAGETAIL	..MODULEID	..PTR
..RESPONSEID	..TASKHEAD	..TASKTAIL
..TYPE	A	ACCESSPTR
AH	ANGLECOUNTS	ANGLEMESSAGE
AXISERROR	AXISFORCE	BASEAXIS1POS
BASEAXIS2POS	BASEAXIS3POS	BASEFORCEACTIVE
BH	BLINKSCLEARED	BUFFER
CAL	CALWARNING	CHECKSUM
COL	COMMANDCODE	COMMANDEXCHANGE
COMMANDMSGPTR	COMMANDPTR	COMMANDTABLE
COMMANDTYPE	CURRENTHANDHEIGHTOFFSET	CURRENTHANDLATERALOFFSET
CURRENTHANDREACHOFFSET	DUMMYCODE	ENTRYNOTFOUNDMESSAGE
EXPSYMBOLTABLEENTRY	FKEY	GRIPCOUNTS
GRIPTOFORCEACTIVE	H	HANDGEOMETRYPTR
HEIGHTCOUNTS	HEIGHTMESSAGE	INITERRORMESSAGE
J	LASTPOSITIONTYPE	MAINMESSAGE
MESSAGEPTR	MODULEWAIT	MONUMENTANGLE
MONUMENTHEIGHT	MONUMENTREACH	MOVEMENTCOMMAND
NEWRACK	NUMBER	OUTPUTVOLTAGE
PARMPTR	POSITIONTYPE	PRESSUREMESSAGE
RACKCOMMANDENTRYPTR	RACKCOMMANDPTR	RACKINDEXPTR
RAMPTR	REACHCOUNTS	REACHMESSAGE
RNO	RN1	RN2
RN3	RN4	RN5
ROBOTCOMMANDCODE	ROBOTSTATUS	ROW
SPACES	SPEEDMUL	STOPKEYPRESSED
SYRINGECOUNTS	TIMEOUT	TRIES
VARIABLEDATAPTR	WAITFORRETURN	WIDENUMFORMAT
WRISTAXIS1POS	WRISTAXIS2POS	WRISTAXIS3POS
WRISTCOUNTS	WRISTMESSAGE	ZPCASE

FUNCT: VIBRATORUNITS	START: 140 ORCA1.CC	
USERS: MOVETOLOCATIONSCREEN	INITZYMATE	
CALLS: IABS		
PARAM: VIBRATORSPEED		
LOCAL: UNITS		

FUNCT: LOADDATABASEWAIT	START: 160 ORCA1.CC	
USERS: INITZYMATE		
CALLS: ZYMATEWAIT	LOADDATABASE	
PARAM: AXIS1ACCEL	AXIS1OFFSET	AXIS1SPEED
AXIS2ACCEL	AXIS2OFFSET	AXIS2SPEED
AXIS3ACCEL	AXIS3OFFSET	AXIS3SPEED

FUNCT: LOADDATAWRISTWAIT	START: 175 ORCA1.CC	
USERS: INITZYMATE		
CALLS: ZYMATEHANDWAIT	LOADDATAWRIST	
PARAM: AXIS1ACCEL	AXIS1SPEED	AXIS2ACCEL
AXIS2SPEED	AXIS3ACCEL	AXIS3SPEED

FUNCT: CLEARKEYBOXES	START: 189 ORCA1.CC	
USERS: HANDDEFINITIONSCREEN	ZYMATEHANDPROGRAMMING	ZYMATEPROGRAMMING
CALLS: DISPLAY	LAST	
GLOBAL: I	SPACES	

FUNCT: CLEARFUNCTIONAREA	START: 210 ORCA1.CC	
USERS: BASECOORDINATESCREEN	BASESPEEDSCREEN	BASESENSESCREEN
MONUMENTSCREEN	PROGRAMMINGCOMMANDSCREEN	CALIBRATIONSCREEN
RACKSETUPSCREEN	WRISTCALIBRATIONSCREEN	HANDCOORDINATESCREEN
HANDSPEEDSCREEN	HANDSENSESCREEN	HANDDEFINITIONSCREEN

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	DELETECOMMANDSCREEN	ZYMATEHANDPROGRAMMING	ZYMATEPROGRAMMING
C/	DISPLAY	LAST	
G/	I	SPACES	
<hr/>			
FUNCT:	CLEARNAMEAREA	START: 223 ORCA1.CC	
USERS:	MONUMENTSCREEN		
CALLS:	DISPLAY	LAST	
GLOBL:	SPACES		
<hr/>			
FUNCT:	VALUEENTERED	START: 260 ORCA1.CC	
USERS:	DOCAL	MOVETOLOCATIONSCREEN	MOVETOCOORDINATESSCREEN
CALLS:	CURSORON	DISPLAY	GETCHAR
	CURSOROFF	TYPEIN	TYPECHAR
	CURRUBOUT		
GLOBL:	BUFFER	CHAR	I
PARAM:	BUFFERWIDTH	COL	ROW
<hr/>			
FUNCT:	DISPLAYMAINSSCREEN	START: 332 ORCA1.CC	
USERS:	ZYMATEPROGRAMMING		
CALLS:	DISPLAY	KEYBOXES	
GLOBL:	I	MAINMESSAGE	
<hr/>			
FUNCT:	DISPLAYBASEFUNCTIONKEYS	START: 358 ORCA1.CC	
USERS:	HANDDEFINITIONSCREEN	ZYMATEPROGRAMMING	
CALLS:	DISPLAY		
<hr/>			
FUNCT:	DISPLAYHANDFUNCTIONKEYS	START: 373 ORCA1.CC	
USERS:	HANDDEFINITIONSCREEN	ZYMATEHANDPROGRAMMING	
CALLS:	DISPLAY		
<hr/>			
FUNCT:	BASEFUNCTIONSCREEN	START: 387 ORCA1.CC	
USERS:	ZYMATEPROGRAMMING		
CALLS:	DISPLAY		
<hr/>			
FUNCT:	HANDFUNCTIONSCREEN	START: 406 ORCA1.CC	
U/	ZYMATEHANDPROGRAMMING		
C/	DISPLAY		
<hr/>			
FUNCT:	BASECOORDINATESCREEN	START: 422 ORCA1.CC	
USERS:	ZYMATEPROGRAMMING		
CALLS:	CLEARFUNCTIONAREA	DISPLAY	LAST
	BASEFKEYS	SIZE	FINDB
	STORECOMMANDVARIABLE		
GLOBL:	CHAR	ZPCASE	
LOCAL:	ZPKEYS		
<hr/>			
FUNCT:	BASESPEEDSCREEN	START: 460 ORCA1.CC	
USERS:	ZYMATEPROGRAMMING		
CALLS:	CLEARFUNCTIONAREA	DISPLAY	LAST
	BASEFKEYS	FINDB	SIZE
	STORECOMMANDVARIABLE		
GLOBL:	CHAR	ZPCASE	
LOCAL:	ZPKEYS		
<hr/>			
FUNCT:	BASESENSESCREEN	START: 502 ORCA1.CC	
USERS:	ZYMATEPROGRAMMING		
CALLS:	CLEARFUNCTIONAREA	DISPLAY	LAST
	BASEFKEYS	SIZE	FINDB
	GETBASEFORCEVALUES	DISPLAYBASEFORCES	STORECOMMANDVARIABLE
GLOBL:	CHAR	ZPCASE	
LOCAL:	ZPKEYS		
<hr/>			
FUNCT:	MONUMENTSCREEN	START: 545 ORCA1.CC	
USERS:	ZYMATEPROGRAMMING		
CALLS:	CLEARFUNCTIONAREA	CLEARNAMEAREA	UPDATELASTNAME
	LAST	DISPLAY	LOW
	HIGH	LOOKUPEXPSYMBOL	FINDSYMBOL
	DELETEEXPSYMBOL	FDISPLAY	FORCEUPPER
	GETCHAR	TYPECHAR	MOVEZYMATEIILLACKNOWLEDGE
	FINPUT	SIZE	STOREEXPSYMBOL
	CHANGEEXPSYMBOL	MOVB	SETABSOLUTE
	COMMAND	COMMANDENTRY	
	ABBREV	CHAR	COMMANDCODE
	COMMANDPTR	DUMMYPTR	FORMAT
	G	LENGTH	MODULEID
	MYMODULEID	NAME	NAMEFORMAT
	NAMELENGTH	RAMPTR	RESPONSE
	SPACES	TYPE	

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LOCAL: NEWMONUMENT	NEWNAME	
<hr/>		
F : PROGRAMMINGCOMMANDSCREEN	START: 719 ORCA1.CC	
L : ZYMATEPROGRAMMING		
CALLS: CLEARFUNCTIONAREA	DISPLAY	LAST
BASEFKEYS	FINDB	SIZE
STOREIMMEDIATECOMMAND		
GLOBL: CHAR	ZPCASE	
LOCAL: ZPKEYS		
<hr/>		
FUNCT: DOCAL	START: 765 ORCA1.CC	
USERS: CALIBRATIONSCREEN	WRISTCALIBRATIONSCREEN	
CALLS: STROBECHAR	VALUEENTERED	ASCIITOREAL
FIX	UNSIGN	DOUBLE
LOW	DDIV	DMUL
SIGNED	DISPLAY	
GLOBL: BUFFER	CAL	CALFACTOR
CALWARNING	CHAR	NUMBER
PENDINGVALUE	RN1	
PARAM: AXISCALFACTORPTR	AXISPOSPTR	CAL10PERCENT
COL	FORMATPTR	ROW
LOCAL: TEMPCALFACTOR		
<hr/>		
FUNCT: DOBASEZEROS	START: 833 ORCA1.CC	
USERS: CALIBRATIONSCREEN		
CALLS: STROBECHAR	FORCEUPPER	INPUT
MOVEZYMATE	RECEIVEMESSAGETIMEDWAIT	
GLOBL: CAL	CALFACTOR.ANGLEZERO	CALFACTOR.HEIGHTZERO
CALFACTOR.REACHZERO	DUMMYPTR	
LOCAL: CHAR	FKEY	
<hr/>		
FUNCT: DOWRISTZEROS	START: 900 ORCA1.CC	
USERS: WRISTCALIBRATIONSCREEN		
CALLS: STROBECHAR	FORCEUPPER	INPUT
MOVEHAND	RECEIVEMESSAGETIMEDWAIT	
G : CAL	CALFACTOR.GRIPZERO	CALFACTOR.SYRINGEZERO
CALFACTOR.WRISTZERO	DUMMYPTR	
: CHAR	FKEY	
<hr/>		
FUNCT: CALIBRATIONSCREEN	START: 957 ORCA1.CC	
USERS: ZYMATEPROGRAMMING		
CALLS: CLEARFUNCTIONAREA	DISPLAY	STROBECHAR
FORCEUPPER	DOCAL	LAST
DOBASEZEROS	FDISPLAY	SETUPROBOTMESSAGE
COMMUNICATEWITHROBOT	SETFACTORYCAL	SAVECALIBRATIONDATA
MOVEZYMATE	TELLPOSITION	
GLOBL: ACCESSPTR	C	CAL
CALFACTOR.ANGLE	CALFACTOR.ANGLEZERO	CALFACTOR.HEIGHT
CALFACTOR.HEIGHTZERO	CALFACTOR.REACH	CALFACTOR.REACHZERO
CHAR	F	FIRSTDISPLAY
PENDINGHEIGHT	PENDINGREACH	ROBOTMESSAGE
SPACES	TEXT	WIDENUMFORMAT
WORDDATA	Z	
<hr/>		
FUNCT: WRISTCALIBRATIONSCREEN	START: 1062 ORCA1.CC	
USERS: ZYMATEHANDPROGRAMMING		
CALLS: CLEARFUNCTIONAREA	DISPLAY	FORCEUPPER
STROBECHAR	DOCAL	LAST
DOWRISTZEROS	FDISPLAY	SETUPROBOTMESSAGE
COMMUNICATEWITHROBOT	SETFACTORYCAL	SAVECALIBRATIONDATA
MOVEHAND	TELLPOSITION	
GLOBL: ACCESSPTR	C	CAL
CALFACTOR.GRIP	CALFACTOR.GRIPZERO	CALFACTOR.SYRINGE
CALFACTOR.SYRINGEZERO	CALFACTOR.WRIST	CALFACTOR.WRISTZERO
CHAR	F	PENDINGGRIP
PENDINGSYRINGE	PENDINGWRIST	ROBOTMESSAGE
SPACES	TEXT	WIDENUMFORMAT
WORDDATA	Z	
<hr/>		
FUNCT: HANDCOORDINATESCREEN	START: 1152 ORCA1.CC	
US : ZYMATEHANDPROGRAMMING		
CLEARFUNCTIONAREA	DISPLAY	LAST
HANDFKEYS	SIZE	FINDB
STORECOMMANDVARIABLE		
GLOBL: CHAR	ZPCASE	
LOCAL: ZPKEYS		
<hr/>		
FUNCT: HANDSPEEDSCREEN	START: 1190 ORCA1.CC	

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USERS: ZYMATEHANDPROGRAMMING
 C CLEARFUNCTIONAREA
 HANDKEYS
 STORECOMMANDVARIABLE
 GLOBL: CHAR
 LOCAL: ZPKEYS

DISPLAY
 SIZE
 ZPCASE

LAST
 FINDB

FUNCT: HANDSENSESCREEN
 USERS: ZYMATEHANDPROGRAMMING
 CALLS: CLEARFUNCTIONAREA
 HANDKEYS
 GETWRISTFORCEVALUES
 GLOBL: CHAR
 LOCAL: ZPKEYS

START: 1232 ORCA1.CC
 DISPLAY
 FINDB
 DISPLAYCURRENTGRIPFORCE
 ZPCASE

LAST
 SIZE
 STORECOMMANDVARIABLE

FUNCT: HANDDEFINITIONSCREEN
 USERS: ZYMATEHANDPROGRAMMING
 CALLS: CLEARFUNCTIONAREA
 LOOKUPEXPSYMBOL
 SAL
 CLEARKEYBOXES
 MOVEZYMATEILLACKNOWLEDGE
 COS
 GETDICTIONARYHANDOFFSETS
 CHANGEEXPSYMBOL
 DEFIN: COMMAND
 GLOBL: ABBREV
 CHAR
 CURRENTHANDNAME
 HANDGEOMETRYPTR
 LATERALOFFSET
 MONUMENTANGLE
 MYMODULEID
 RAMPTR
 RESPONSE
 L : NEWHAND

START: 1273 ORCA1.CC
 LOW
 DISPLAY
 FINPUT
 DISPLAYBASEFUNCTIONKEYS
 DISPLAYHANDFUNCTIONKEYS
 FIX
 SIZE
 DISPLAYCURRENTHAND
 COMMANDENTRY
 ANGLE
 COMMANDCODE
 FORMAT
 HEIGHT
 LENGTH
 MONUMENTHEIGHT
 NAME
 REACH
 SPACES

HIGH
 MOV8
 MOVEHANDTILLACKNOWLEDGE
 LAST
 FLOAT
 SIN
 STOREEXPSYMBOL
 HANDGEOMETRY
 BASEPAGE
 COMMANDPTR
 G
 HEIGHTOFFSET
 MODULEID
 MONUMENTREACH
 NAMELENGTH
 REACHOFFSET
 TYPE

T: INPUTANDMOVETORACKINDEX
 CALLS: MOVETOLOCATIONSSCREEN
 DISPLAYCURRENTHAND
 MOVETORACKINDEX
 GLOBL: ABORT
 NUMBER
 PENDINGREACH
 REFHEIGHT

START: 1404 ORCA1.CC
 DISPLAY
 COMMANDPTR
 PENDINGANGLE
 RACKCOMMANDPTR
 REFREACH

FINPUT
 CURRENTNAMETYPE
 PENDINGHEIGHT
 REFANGLE

FUNCT: GETSCALEDATA
 USERS: MOVETOLOCATIONSSCREEN
 CALLS: FIX
 GLOBL: RN1
 PARAM: SCALEFACTOR

START: 1431 ORCA1.CC

FUNCT: RANGECHECKVALUE
 USERS: MOVETOLOCATIONSSCREEN
 GLOBL: RN1
 PARAM: HIGH

START: 1438 ORCA1.CC
 LOW

FUNCT: MOVETOLOCATIONSSCREEN
 USERS: ZYMATEHANDPROGRAMMING
 CALLS: UPDTELASTNAME
 FINPUT
 VALUEENTERED
 COMPUTERELATIVE
 RANGECHECKVALUE
 COMMUNICATEWITHROBOT
 VIBRATORUNITS
 LOADDATABASE
 SAL
 MOVEZYMATE
 REALTOASCII
 DF : COMMAND
 ABSOLUTESIGN
 AXISFORCE
 COMMANDPTR
 CURRENTNAMETYPE
 FIRSTDISPLAY
 GRIPTOFORCEVALUE
 HEIGHT

START: 1457 ORCA1.CC
 ZYMATEPROGRAMMING
 LAST
 MOV8
 ASCII TOREAL
 COMPUTEHAND
 GETSCALEDATA
 ZYMATEHANDWAIT
 FLOAT
 LOADDATAWRIST
 DISPLAYCURRENTHAND
 MOVEHAND
 NUMOUT
 COMMANDENTRY
 ANGLE
 BUFFER
 CURRENTHANDNAME
 DIRECTPATH
 GRIPACCEL
 HANDGEOMETRYPTR
 HEIGHTSPEED

DISPLAY
 FINDSYMBOL
 COMPUTEABSOLUTE
 INPUTANDMOVETORACKINDEX
 SETUPROBOTMESSAGE
 FIX
 UNSIGN
 LOOKUPEXPSYMBOL
 GETDICTIONARYHANDOFFSETS
 TELLPOSITION
 FDISPLAY
 ZYMATEPLACE
 ANGLESPEED
 COMMANDCODE
 CURRENTNAME
 ENTRYNOTFOUNDMESSAGE
 GRIPSPEED
 HANDSIGN
 I

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MODULEID NAME NUMBER PENDINGGRIP PENDINGSYRINGE RAMPTR REACHSPEED REFHEIGHT RESPONSE ROBOTSPEED SETABSWARNING SYRINGESPEED VERTICALACCEL WRISTACCEL	MOVEMENTCOMMAND NAMEFORMAT OUTPUTVOLTAGE PENDINGHEIGHT PENDINGWRIST REACH REACHTRANSOFFSET REFREACH RN1 ROTARYACCEL SPACES TEXT VERTICALTRANSOFFSET WRISTSPEED DICSYMPTR	MYMODULEID NAMELENGTH PENDINGANGLE PENDINGREACH POSITIONTYPE REACHACCEL REFANGLE RELATIVESIGN ROBOTMESSAGE ROTARYTRANSOFFSET SYRINGEACCEL TYPE VIBRATORSPEED
LOCAL: CODE		INT
FUNCT: RESTOREPOSITION USERS: MOVETOCOORDINATESSCREEN CALLS: TELLPOSITION GLOBL: ANGLE HEIGHT PENDINGHEIGHT PENDINGWRIST WRIST	START: 1855 ORCA1.CC ZYMATEPROGRAMMING FIRSTDISPLAY PENDINGANGLE PENDINGREACH REACH	GRIP PENDINGGRIP PENDINGSYRINGE SYRINGE
FUNCT: GETSCALEDNR1 USERS: MOVETOCOORDINATESSCREEN CALLS: ASCIIITOREAL GLOBL: BUFFER PARAM: MAX	START: 1868 ORCA1.CC FLOAT RN1 MIN	FIX SCALEFACTOR
FUNCT: MOVETOCOORDINATESSCREEN USERS: ZYMATEHANDPROGRAMMING CALLS: UPDATELASTNAME GETSCALEDNR1 DISPLAY G. BUFFER PENDINGANGLE PENDINGREACH	START: 1890 ORCA1.CC ZYMATEPROGRAMMING VALUEENTERED MOVEZYMATE TELLPOSITION FIRSTDISPLAY PENDINGGRIP PENDINGSYRINGE	RESTOREPOSITION MOVEHAND I PENDINGHEIGHT PENDINGWRIST
FUNCT: CHANGELOCATIONSCREEN USERS: ZYMATEHANDPROGRAMMING CALLS: UPDATELASTNAME DISPLAY SETHAND DEFIN: COMMAND GLOBL: ABSOLUTESIGN ENTRYNOTFOUNDMESSAGE MYMODULEID NAMELENGTH RESPONSE	START: 1958 ORCA1.CC ZYMATEPROGRAMMING FINPUT SETABSOLUTE CHANGEEXPSYMBOL COMMANDENTRY COMMANDCODE HANDSIGN NAME RAMPTR TYPE	LOOKUPEXPSYMBOL SETRELATIVE TYPEN COMMANDPTR MODULEID NAMEFORMAT RELATIVESIGN
FUNCT: DELETECOMMANDSCREEN USERS: ZYMATEHANDPROGRAMMING CALLS: CLEARFUNCTIONAREA LOOKUPEXPSYMBOL DEFIN: COMMAND GLOBL: COMMANDPTR MYMODULEID NAMELENGTH	START: 2011 ORCA1.CC ZYMATEPROGRAMMING DISPLAY DELETEEXPSYMBOL COMMANDENTRY ENTRYNOTFOUNDMESSAGE NAME RAMPTR	FINPUT MODULEID NAMEFORMAT RESPONSE
FUNCT: ZYMATEHANDPROGRAMMING USERS: ZYMATEPROGRAMMING CALLS: DISPLAY CLEARFUNCTIONAREA LAST FINDB HANDSPEEDSCREEN STOREROBOTPOSITION CHANGELOCATIONSCREEN TYPEN RECEIVEMESSAGE BASEPAGE FIRSTDISPLAY PRESSREMESSAGE SYRINGESPEED WRISTSPEED LOCAL: ZPKEYS	START: 2052 ORCA1.CC CLEARKEYBOXES HANDFUNCTIONSCREEN HANDFKEYS LOADDATAWRIST HANDSENSESCREEN MOVETOLOCATIONSCREEN DELETECOMMANDSCREEN STROBECHAR CHAR GRIPACCEL SPACES WAITFORRETURN ZPCASE	DISPLAYHANDFUNCTIONKEYS TELLPOSITION SIZE HANDCOORDINATESSCREEN HANDDEFINITIONSCREEN MOVETOCOORDINATESSCREEN WRISTCALIBRATIONSCREEN FORCEUPPER DUMMYPTR GRIPSPEED SYRINGEACCEL WRISTACCEL

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F : ZYMATEPROGRAMMING          START: 2145 ORCA1.CC
I : INITZYMATE
C : CLEARSCREEN                DISPLAYMAINSCREEN          DISPLAYBASEFUNCTIONKEYS
  BASEFUNCTIONSCREEN           TELLPOSITION              UPDATELASTNAME
  LAST                         BASEFKEYS                        SIZE
  FINDB                        DISPLAY                          LOADDATABASE
  BASECOORDINATESCREEN        CLEARFUNCTIONAREA         BASESPEEDSCREEN
  STOREROBOTPOSITION          BASESENSESCREEN            MOVETOLOCATIONSCREEN
  MOVETOCOORDINATESCREEN      CHANGELOCATIONSCREEN        RACKSETUPSCREEN
  MONUMENTSCREEN              PROGRAMMINGCOMMANDSCREEN  DELETecomMANDSCREEN
  CALIBRATIONSCREEN           RESTOREPOSITION            ZYMATEHANDPROGRAMMING
  CLEARKEYBOXES               TYPEN                      STROBECHAR
  FORCEUPPER                   RECEIVEMESSAGETIMEDWAIT
GLOBL: ANGLSPEED              BASEPAGE                    CHAR
  DUMMYPTR                    FIRSTDISPLAY                HEIGHTSPEED
  MAINMESSAGE                 PRESSRETMESAGE             REACHACCEL
  REACHSPEED                  REACHTRANSOFFSET           ROTARYACCEL
  ROTARYTRANSOFFSET           SPACES                      VERTICALACCEL
  VERTICALTRANSOFFSET         WAITFORRETURN              ZPCASE
LOCAL: ZPKEYS
-----
FUNCT: RANGECHECKEDSPEEDIN     START: 2283 ORCA1.CC
USERS: INITZYMATE
CALLS: FLOAT                   SIGNED                      FIX
  UNSIGN
DEFIN: VARIABLECOMMAND
GLOBL: VALUE
PARAM: MAXSPEED               MINSPEED
-----
FUNCT: RANGECHECKPOSITION      START: 2303 ORCA1.CC
USERS: INITZYMATE
DEFIN: VARIABLECOMMAND
GLOBL: VALUE
-----
F : TESTNEWFORPENDING         START: 2320 ORCA1.CC
U : INITZYMATE
I : VARIABLECOMMAND
GLOBL: MOVEMENTCOMMAND        VALUE
-----
FUNCT: RETURNTOEXEC           START: 2334 ORCA1.CC
USERS: INITZYMATE
CALLS: SENDMESSAGE
DEFIN: COMMAND
GLOBL: ABORT                  COMMANDMSG                  COMMANDMSGPTR
  RESPONSEID                  COMMANDCODE
-----
FUNCT: INITZYMATE              START: 2344 ORCA1.CC
CALLS: GETRAM                  SIZE                        LOW
  HIGH                         CREATEEXCHANGE              MOVB
  STOREEXPSYMBOL              TYPEN                      TYPECLRF
  CHANGEEXPSYMBOL             FREERAM                     INITZYMATEROBOT
  LOADDATAWRIST               LOADDATABASE                RECEIVEMESSAGE
  SHR                          XLAT                        CLEARSCREEN
  FORCEUPPER                   STROBECHAR                  RETURNTOEXEC
  ZYMATEPROGRAMMING           COMPUTEABSOLUTE              COMPUTERELATIVE
  COMPUTEHAND                  COMPUTERACKLOCATION           TESTNEWFORPENDING
  RANGECHECKPOSITION          FIX                          FLOAT
  DIRVND                      SETUPROBOTMESSAGE            COMMUNICATEWITHROBOT
  GETPOSITION                  STOPMONITOR                  ZYMATEHANDWAIT
  RECEIVEMESSAGETIMEDWAIT     GETWRISTFORCEVALUES          VIBRATORUNITS
  RANGECHECKEDSPEEDIN         LOADDATABASEWAIT            SIGNED
  LOADDATAWRISTWAIT           ZYMATEWAIT                   GETBASEFORCEVALUES
  LOOKUPEXPSYMBOL             SAL                          GETDICTIONARYHANDOFFSETS
  MOVEZYMATE                  MOVEHAND
DEFIN: COMMAND                 COMMANDENTRY                COMMANDMSG
  HANDGEOMETRY                IMMEDIATECOMMAND             MODULE
  MODULEDATA                  PARM                         RETURNDATA
  VARIABLECOMMAND
GLOBL: ABBREV                  ABORT                       ACCESSPTR
  ANGLE                        ANGLEMESSAGE                 ANGLEMESSAGE
  ANGLSPEED                    AXISFORCE                    BASEFORCEACTIVE
  CHAR                          COMMANDCODE                  COMMANDEXCHANGE
  COMMANDEXCHANGE.EXCHANGEID   COMMANDMODE                  COMMANDMSGPTR
  COMMANDPTR                   COMMANDTABLE                 COMMANDTYPE
  CURRENTHANDNAME              DIRECTPATH                    DUMMYPTR
  EXCHANGEID                   FORMAT                        FORMATCODE
  GRIP                         GRIPACCEL                    GRIPFORCE

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GRIPSPEED	GRIPTOFORCEACTIVE	GRIPTOFORCEVALUE
HANDGEOMETRYPTR	HEIGHT	HEIGHTFORCE
HEIGHTMESSAGE	HEIGHTSPEED	I
INITERRORMESSAGE	KEYPADSTATUS	LASTPOSITIONTYPE
LENGTH	MODULEID	MODULEWAIT
MOVEMENTCOMMAND	MOVING	MYMODULEID
NAME	NAMELENGTH	OUTPUTVOLTAGE
PARMPTR	PENDINGANGLE	PENDINGGRIP
PENDINGHEIGHT	PENDINGREACH	PENDINGSYRINGE
PENDINGWRIST	POSITIONTYPE	PRESSRETMESAGE
PTR	PTRTOPARMS	RAMPTR
REACH	REACHACCEL	REACHFORCE
REACHMESSAGE	REACHSPEED	REACHTRANSOFFSET
REFANGLE	REFHEIGHT	REFREACH
RESPONSE	ROBOTMESSAGE	ROBOTSPEED
ROTARYACCEL	ROTARYTRANSOFFSET	SETABSWARNING
SETUPCOMMAND	SYRINGEACCEL	SYRINGESPEED
TEXT	TYPE	VALUE
VERTICALACCEL	VERTICALTRANSOFFSET	VIBRATORSPEED
WRISTACCEL	WRISTMESSAGE	WRISTSPEED
WRISTSTATUS		
PARAM: ZYMATEID		
LOCAL: ANGLEFAULT	HEIGHTFAULT	INITFAULT
REACHFAULT	SYRINGEFAULT	WRISTFAULT

FUNCT: GETPOSITION	START: 79 ORCA2.CC	
USERS: STOPANDREINITROBOT	INITZYMATEROBOT	INITZYMATE
CALLS: SETUPROBOTMESSAGE	COMMUNICATEWITHROBOT	DDIV
DOUBLE	DMUL	LOW
SIGNED		
GLOBL: A	ANGLE	B
C	CALFACTOR.ANGLE	CALFACTOR.ANGLEZERO
CALFACTOR.GRIP	CALFACTOR.GRIPZERO	CALFACTOR.HEIGHT
CALFACTOR.HEIGHTZERO	CALFACTOR.REACH	CALFACTOR.REACHZERO
CALFACTOR.SYRINGE	CALFACTOR.SYRINGEZERO	CALFACTOR.WRIST
CALFACTOR.WRISTZERO	GRIP	HEIGHT
PENDINGGRIP	PENDINGSYRINGE	REACH
ROBOTMESSAGE	SYRINGE	TEMP
TEXT	WRIST	
PARAM: PORTADDRESS		
LOCAL: ..A	..B	..C
ROBOTCOMMANDCODE	TEMPPTR	

FUNCT: DISPLAYCOLLISIONMESSAGE	START: 203 ORCA2.CC	
USERS: STOPANDREINITROBOT		
CALLS: DISPLAY	TYPEN	SHR
GLOBL: BASESTATUS	COMMANDMODE	WRISTSTATUS
PARAM: AXISID		
LOCAL: NOTINPOSMMSG		

FUNCT: SETABSOLUTE	START: 263 ORCA2.CC	
USERS: MONUMENTSCREEN	STOREROBOTPOSITION	CHANGELocationSCREEN
CALLS: SAR		
DEFIN: COMMAND		
GLOBL: ANGLE	HEIGHT	REACH
REFANGLE	REFHEIGHT	REFREACH

FUNCT: SETRELATIVE	START: 274 ORCA2.CC	
USERS: STOREROBOTPOSITION	CHANGELocationSCREEN	
CALLS: SAR		
DEFIN: COMMAND		
GLOBL: ANGLE	HEIGHT	REACH
REFANGLE	REFHEIGHT	REFREACH

FUNCT: SETHAND	START: 282 ORCA2.CC	
USERS: STOREROBOTPOSITION	CHANGELocationSCREEN	
CALLS: SAR		
DEFIN: HANDCOMMAND		
GLOBL: GRIP	SYRINGE	WRIST

FUNCT: COMPUTEABSOLUTE	START: 290 ORCA2.CC	
MOVETOLOCATIONSCREEN	INITZYMATE	
CALLS: SAL		
DEFIN: COMMAND		
GLOBL: ANGLE	HEIGHT	PENDINGANGLE
PENDINGHEIGHT	PENDINGREACH	REACH
REFANGLE	REFHEIGHT	REFREACH

C-DOC

FUNCT: COMPUTERELATIVE U : MOVETOLOCATIONSSCREEN C : SAL I: COMMAND GLOBL: ANGLE PENDINGHEIGHT REFANGLE	START: 298 ORCA2.CC INITZYMATE HEIGHT PENDINGREACH REFHEIGHT	PENDINGANGLE REACH REFREACH
FUNCT: COMPUTEHAND USERS: MOVETOLOCATIONSSCREEN CALLS: SAL DEFIN: HANDCOMMAND GLOBL: GRIP PENDINGWRIST	START: 306 ORCA2.CC INITZYMATE PENDINGGRIP SYRINGE	PENDINGSYRINGE WRIST
FUNCT: STOPANDREINITROBOT USERS: ZYMAWAIT ZYMAHANDWAIT CALLS: TYPEN TYPECRLF TELLPOSITION STROBEKEYPAD GLOBL: ABORT CHAR HEIGHT MOVING PENDINGHEIGHT REACH STOPPEDMESSAGE PARAM: AXISID	START: 327 ORCA2.CC BASEFKEYS DISPLAY RELEASE MOVEZYMATE LAST ANGLE COMMANDMODE KEYMESSAGE MYMODULEID PENDINGREACH SPACES WRIST	HANDFKEYS DISPLAYCOLLISIONMESSAGE GETPOSITION MOVEHAND BASESTATUS FIRSTDISPLAY KEYPADSTATUS PENDINGANGLE PENDINGWRIST STOPKEYPRESSED WRISTSTATUS
FUNCT: FORCEUPPER USERS: BASEFKEYS DOBSEZEROS RACKSETUPSCREEN ZYMAHANDPROGRAMMING P : CHAR	START: 392 ORCA2.CC HANDFKEYS DOWRISTZEROS WRISTCALIBRATIONSCREEN INITZYMATE	MONUMENTSCREEN CALIBRATIONSCREEN ZYMAHANDPROGRAMMING
FUNCT: BASEFKEYS USERS: BASECOORDINATESCREEN PROGRAMMINGCOMMANDSCREEN CALLS: FORCEUPPER LOADDATABASE TELLPOSITION STOPANDREINITROBOT GLOBL: BASEPAGE CHAR I PENDINGANGLE REACHACCEL ROTARYTRANSOFFSET VERTICALTRANSOFFSET	START: 407 ORCA2.CC BASESPEEDSCREEN MOVEZYMATETILLACKNOWLEDGE STROBECHAR TESTZYMAPOSITION MOVEZYMATE BASESTATUS DUMMYPTR KEYPADSTATUS PENDINGHEIGHT REACHTRANSOFFSET SPEEDMUL	BASESENSESCREEN ZYMAHANDPROGRAMMING INPUT DISPLAY RECEIVEMESSAGETIMEDWAIT BLINKSCLEARED FKEY MOVING PENDINGREACH ROTARYACCEL VERTICALACCEL
FUNCT: HANDFKEYS USERS: MOVEHANDTILLACKNOWLEDGE HANDSENSESCREEN CALLS: STROBECHAR LOADDATAWRIST TELLPOSITION STOPANDREINITROBOT GLOBL: BASEPAGE CHAR GRIPACCEL MOVING PENDINGWRIST WRISTACCEL	START: 508 ORCA2.CC HANDCOORDINATESCREEN ZYMAHANDPROGRAMMING FORCEUPPER TESTHANDPOSITION MOVEHAND BASESTATUS DUMMYPTR I PENDINGGRIP SPEEDMUL	HANDSPEEDSCREEN INPUT DISPLAY RECEIVEMESSAGETIMEDWAIT BLINKSCLEARED FKEY KEYPADSTATUS PENDINGSYRINGE SYRINGEACCEL
FUNCT: UPDATALASTNAME USERS: MONUMENTSCREEN MOVETOLOCATIONSSCREEN ZYMAHANDPROGRAMMING LAST C : CURRENTNAME SPACES	START: 594 ORCA2.CC STOREROBOTPOSITION MOVETOCOORDINATESCREEN DISPLAY CURRENTNAMETYPE	RACKSETUPSCREEN CHANGELOCATIONSSCREEN FDISPLAY I
FUNCT: DISPLAYCURRENTGRIPFORCE USERS: HANDSENSESCREEN CALLS: DISPLAY	START: 613 ORCA2.CC UNSIGN	IABS

DISPLAYNUMBER G: GRIPFORCE I: NUM		
FUNCT: DISPLAYBASEFORCES USERS: BASESENSESCREEN CALLS: DISPLAY GLOBL: ANGLEFORCE LOCAL: NUM	START: 630 ORCA2.CC IABS HEIGHTFORCE	UNSIGN REACHFORCE
FUNCT: STOREANDCHECKSYMBOL USERS: STORECOMMANDVARIABLE CALLS: MOVV DEFIN: COMMANDENTRY GLOBL: CURRENTNAME RESPONSE	START: 669 ORCA2.CC STOREIMMEDIATECOMMAND STOREEXPSYMBOL NAMELENGTH	STOREROBOTPOSITION DISPLAY RAMPTR
FUNCT: STORECOMMANDVARIABLE USERS: BASECOORDINATESCREEN HANDCOORDINATESCREEN CALLS: DISPLAY SIZE DEFIN: COMMANDVARIABLE GLOBL: ABBREV MODULEID NAMELENGTH VARIABLEDATAPTR PARAM: COL ROW	START: 693 ORCA2.CC BASESPEEDSCREEN HANDSPEEDSCREEN LAST STOREANDCHECKSYMBOL VARIABLEDATA FORMAT MYMODULEID SPACES COMMANDCODE	BASESENSESCREEN HANDSENSESCREEN FINPUT LENGTH NAME TYPE FORMATCODE
FUNCT: STOREIMMEDIATECOMMAND USERS: PROGRAMMINGCOMMANDSCREEN CALLS: DISPLAY SIZE D: COMMAND G: ABBREV LENGTH NAME TYPE PARAM: COL	START: 715 ORCA2.CC LAST STOREANDCHECKSYMBOL COMMANDENTRY COMMANDPTR MODULEID NAMELENGTH COMMANDCODE	FINPUT FORMAT MYMODULEID SPACES ROW
FUNCT: STOREROBOTPOSITION USERS: ZYMATEHANDPROGRAMMING CALLS: UPDATELASTNAME DISPLAY SETRELATIVE DEFIN: COMMAND GLOBL: ABBREV FORMAT MODULEID NAMEFORMAT TYPE PARAM: COMMANDCODE	START: 736 ORCA2.CC ZYMATEPROGRAMMING FINPUT SETHAND STOREANDCHECKSYMBOL COMMANDENTRY ABSOLUTESIGN HANDSIGN MYMODULEID NAMELENGTH	SIZE SETABSOLUTE COMMANDPTR LENGTH NAME RELATIVESIGN
FUNCT: GETCALIBRATIONDATA USERS: INITZYMATEROBOT CALLS: SETUPROBOTMESSAGE GLOBL: CALFACTOR.ANGLE ROBOTMESSAGE	START: 775 ORCA2.CC COMMUNICATEWITHROBOT CALFACTOR.HEIGHT TEXT	MOVV CALFACTOR.WRIST
FUNCT: SAVECALIBRATIONDATA USERS: CALIBRATIONSCREEN CALLS: SETUPROBOTMESSAGE GLOBL: CALFACTOR.HEIGHT TEXT	START: 812 ORCA2.CC WRISTCALIBRATIONSCREEN MOVV CALFACTOR.WRIST	COMMUNICATEWITHROBOT ROBOTMESSAGE
FUNCT: SETFACTORYCAL USERS: CALIBRATIONSCREEN CALLS: MOVEZYMATE GLOBL: CALFACTOR.ANGLE CALFACTOR.GRIPZERO CALFACTOR.REACH CALFACTOR.SYRINGEZERO PARAM: AXISID	START: 823 ORCA2.CC WRISTCALIBRATIONSCREEN MOVEHAND CALFACTOR.ANGLEZERO CALFACTOR.HEIGHT CALFACTOR.REACHZERO CALFACTOR.WRIST	INITZYMATEROBOT CALFACTOR.GRIP CALFACTOR.HEIGHTZERO CALFACTOR.SYRINGE CALFACTOR.WRISTZERO
FUNCT: MOVEZYMATETILLACKNOWLEDGE USERS: MONUMENTSCREEN	START: 855 ORCA2.CC RACKSETUPSCREEN	HANDDEFINITIONSCREEN

C-DOC

CALLS: BASEFKEYS
G' CHAR
ROTARYACCEL
VERTICALTRANSOFFSET

LOADDATABASE
REACHACCEL
ROTARYTRANSOFFSET

REACHTRANSOFFSET
VERTICALACCEL

FUNCT: MOVEHANDTILLACKNOWLEDGE
USERS: HANDDEFINITIONSCREEN
CALLS: HANDFKEYS
GLOBL: CHAR

START: 868 ORCA2.CC

FUNCT: DISPLAYCURRENTHAND
USERS: RACKSETUPSCREEN
MOVETOLOCATIONSCREEN
CALLS: DISPLAY
GLOBL: CURRENTHANDNAME

START: 879 ORCA2.CC
HANDDEFINITIONSCREEN
FDISPLAY

INPUTANDMOVETORACKINDEX

FUNCT: GETDICTIONARYHANDOFFSETS
USERS: RACKSETUPSCREEN
INITZYMATE
CALLS: SAL
DEFIN: HANDGEOMETRY
GLOBL: CURRENTHANDHEIGHTOFFSET
HEIGHTADDON

START: 889 ORCA2.CC
HANDDEFINITIONSCREEN

MOVETOLOCATIONSCREEN

CURRENTHANDLATERALOFFSET
REACHADDON

CURRENTHANDREACHOFFSET
SIDEADDON

FUNCT: MOVETORACKINDEX
USERS: RACKSETUPSCREEN
CALLS: FIX
DISPLAY
SQRT
DEFIN: RACKCOMMAND
GLOBL: A
COMMANDMODE
CURRENTHANDREACHOFFSET
DYC
DZR
PENDINGHEIGHT
RN2
RN5
Y1

START: 897 ORCA2.CC
COMPUTERACKLOCATION
TYPEN
SIGNED
ATAN

INPUTANDMOVETORACKINDEX
TYPECLRF
FLOAT
COS

ABORT
CURRENTHANDHEIGHTOFFSET
DXC
DYR
INDEXWARNING
PENDINGREACH
RN3
ROW
Z1

COL
CURRENTHANDLATERALOFFSET
DXR
DZC
PENDINGANGLE
RN1
RN4
X1

PARAM: INDEX

FUNCT: RACKSETUPSCREEN
USERS: ZYMATEPROGRAMMING
CALLS: GETRAM
DISPLAYCURRENTHAND
LOOKUPEXPSYMBOL
LAST
FDISPLAY
MOVETORACKINDEX
FLOAT
COS
SIZE
FREERAM
DEFIN: COMMANDENTRY
RACKCOMMANDENTRY
GLOBL: ABBREV
COL
CURRENTHANDLATERALOFFSET
DXC
DYR
FORMAT
HEIGHT
MYMODULEID
NAMES
PENDINGANGLE
RACKCOMMANDENTRYPTR
REACH
REFANGLE
RESPONSE
RN2
ROTARYTRANSOFFSET
TYPE
X1

START: 989 ORCA2.CC

CLEARFUNCTIONAREA
DISPLAY
FORCEUPPER
GETDICTIONARYHANDOFFSETS
LOADDATABASE
TELLPOSITION
SQRT
SIN
STOREEXPSYMBOL

UPDATELASTNAME
FINPUT
GETCHAR
MOVB
MOVEZYMATEILLACKNOWLEDGE
MOVEZYMATE
ATAN
SIGNED
CHANGEEXPSYMBOL

HANDGEOMETRY

RACKCOMMAND

ANGLE
COMMANDCODE
CURRENTHANDNAME
DXR
DZC
G
LENGTH
NAME
NEWRACK
PENDINGHEIGHT
RACKCOMMANDPTR
REACHACCEL
REFHEIGHT
RN0
RN3
ROW
VERTICALACCEL
Y1
TEMPINT

CHAR
CURRENTHANDHEIGHTOFFSET
CURRENTHANDREACHOFFSET
DYC
DZR
HANDGEOMETRYPTR
MODULEID
NAMELENGTH
NUMBER
PENDINGREACH
RAMPTR
REACHTRANSOFFSET
REFREACH
RN1
ROTARYACCEL
SPACES
VERTICALTRANSOFFSET
Z1

LOCAL: MOVERACK

FUNCT: COMPUTERACKLOCATION
USERS: INITZYMATE
CALLS: MOVETORACKINDEX

START: 1277 ORCA2.CC

GETRAM

MOVB

C-DOC

LOOKUPEXPSYMBOL TYPES FREERAM : RACKCOMMAND GLOBAL: ABORT COMMANDMODE DXR DZC NAMELENGTH RACKINDEXPTR	UNSIGN TYPEM RACKINDEX ACCESSPTR COMMANDPTR DYC DZR NAMES RESPONSE	FIX TYPECRLF REALDATA COL DXC DYR NAME RACKCOMMANDPTR

FUNCT: INITZYMATEROBOT USERS: INITZYMATE CALLS: GETRAM RESETMESSAGEAREAAANDUART CREATETASK SETFACTORYCAL MOVEZYMATE ZYMATEHANDWAIT GLOBAL: ANGLE CURRENTHANDHEIGHTOFFSET CURRENTHANDREACHOFFSET GRIP HEIGHTSPEED MODULEID PENDINGANGLE PENDINGREACH PRIORITY REACHSPEED REFREACH RETURNEXCHANGE.EXCHANGEID ROBOTSPEED STOPEXCHANGE STOPMONITORACTIVE STOPTASKMESSAGE.DESTINATIONID STOPTASKMESSAGE.RESPONSEID SYRINGESPEED : DUMMYCODE	START: 1329 ORCA2.CC SIZE MOVB FREERAM LAST MOVEHAND ANGLESPEED CURRENTHANDLATERALOFFSET CURRENTNAME GRIPSPEED I MODULENAME PENDINGGRIP PENDINGSYRINGE RDIR REFANGLE RESPONSEID ROBOTMESSAGE STACKSIZE STOPEXCHANGE.EXCHANGEID STOPTASK STOPTASKMESSAGE.HOMEID STOPTASKMESSAGE.TYPE WRIST STOPTASKPTR	CREATEEXCHANGE CURRENTCS GETCALIBRATIONDATA GETPOSITION ZYMATEWAIT CODESEG CURRENTHANDNAME DATASIZE HEIGHT INITIALIP MYMODULEID PENDINGHEIGHT PENDINGWRIST REACH REFHEIGHT RETURNEXCHANGE ROBOTMESSAGEPTR STATICTASKDESCRIPTOR STOPKEYPRESSED STOPTASKMESSAGE STOPTASKMESSAGE.LENGTH SYRINGE WRISTSPEED

FUNCT: STOPPROGRAM CALLS: GETRAM RECEIVEMESSAGETIMEDWAIT DEFIN: WORDDATA GLOBAL: BYTESIN CHANNELPTR HOMEID MAXRXWAIT MYMODULEID STOPEXCHANGE.EXCHANGEID STOPMONITORACTIVE TEXT LOCAL: ACCESSPTR STOPMESSAGEPTR	START: 1403 ORCA2.CC SIZE SENDMESSAGE BYTESOUT CONTROLIMAGE KEYPADSTATUS MAXTXWAIT POSTTERMCHARS STOPKEYPRESSED TERMCHAR1 TYPE COUNTER	RECEIVEMESSAGE CHANNELMESSAGEDESCRIPTOR DESTINATIONID LENGTH MOVING RESPONSEID STOPMESSAGE TERMCHAR2 MESSAGEPTR

FUNCT: DIVRND USERS: GETWRISTFORCEVALUES PARAM: DIVIDEND	START: 68 ORCA3.CC INITZYMATE DIVISOR	

FUNCT: RESETMESSAGEAREAAANDUART USERS: SENDMESSAGETILLGOODSTATUS CALLS: TIME DEFIN: TIMERO WORDDATA GLOBAL: ACCESSPTR DESTINATIONID MAXTXWAIT POSTTERMCHARS TERMCHAR2	START: 96 ORCA3.CC INITZYMATEROBOT TIMERCMD CHANNELPTR HOMEID MYMODULEID ROBOTMESSAGE TYPE	UARTOFFSET CONTROLIMAGE MAXRXWAIT OUTPUT TERMCHAR1

FUNCT: SETUPROBOTMESSAGE USERS: GETPOSITION ZYMATEWAIT GETCALIBRATIONDATA GETBASEFORCEVALUES WRISTCALIBRATIONSCREEN CALLS: SIZE GLOBAL: BYTESIN ROBOTMESSAGE	START: 137 ORCA3.CC DOPOSITIONCONTROL LOADDATABASE SAVECALIBRATIONDATA GETWRISTFORCEVALUES MOVETOLOCATIONSCREEN BYTESOUT TEXT	REDOPOSITIONCONTROL ZYMATEHANDWAIT LOADDATAWRIST CALIBRATIONSCREEN INITZYMATE LENGTH

C-DOC

PARAM: COMMAND	DATABYTESIN	DATABYTESOUT
F : SENDMESSAGE TILLGOODSTATUS : COMMUNICATEWITHROBOT CALLS: SENDMESSAGE CLEARSCREEN RELEASE GLOBL: J MYMODULEID RETURNEXCHANGE.EXCHANGEID LOCAL: GOOD	START: 150 ORCA3.CC RECEIVEMESSAGE FDISPLAY KEYPADSTATUS NAMEFORMAT ROBOTMESSAGE TRIES	RESETMESSAGEAREAANDUART DOUBLE MESSAGEPTR RETURNCODE
FUNCT: COMPUTECHECKSUM USERS: COMMUNICATEWITHROBOT GLOBL: CHECKSUM PARAM: INDEX LOCAL: I	START: 190 ORCA3.CC ROBOTMESSAGE	TEXT
FUNCT: RETURNCHECKSUMOK USERS: COMMUNICATEWITHROBOT GLOBL: I PARAM: BUFFERINDEX LOCAL: RETURNCHECK	START: 204 ORCA3.CC ROBOTMESSAGE CHECKSUMINDEX	TEXT
FUNCT: COMMUNICATEWITHROBOT USERS: GETPOSITION ZYMATEWAIT GETCALIBRATIONDATA GETBASEFORCEVALUES WRISTCALIBRATIONSCREEN CALLS: COMPUTECHECKSUM GLOBL: BYTESIN KEYPADSTATUS TEXT	START: 226 ORCA3.CC DOPOSITIONCONTROL LOADDATABASE SAVECALIBRATIONDATA GETWRISTFORCEVALUES MOVETOLOCATIONSCREEN SENDMESSAGE TILLGOODSTATUS BYTESOUT ROBOTMESSAGE	REDOPOSITIONCONTROL ZYMATEHANDWAIT LOADDATAWRIST CALIBRATIONSCREEN INITZYMATE RETURNCHECKSUMOK CHECKSUM ROBOTSTATUS
F : STOPMONITOR U : DOPOSITIONCONTROL S: SENDMESSAGE L : MOVING STO TASKMESSAGE	START: 248 ORCA3.CC INITZYMATE STOPEXCHANGE.EXCHANGEID	STOPMONITORACTIVE
FUNCT: DOPOSITIONCONTROL USERS: MOVEZYMATE CALLS: SETUPROBOTMESSAGE COMMUNICATEWITHROBOT GLOBL: BASEAXIS1POS ROBOTCOMMANDCODE WRISTAXIS1POS PARAM: AXIS1POS PORTADDR	START: 259 ORCA3.CC MOVEHAND LOW STOPMONITOR BASEAXIS2POS ROBOTMESSAGE WRISTAXIS2POS AXIS2POS	HIGH BASEAXIS3POS TEXT WRISTAXIS3POS AXIS3POS
FUNCT: REDOPOSITIONCONTROL USERS: ZYMATEWAIT CALLS: SETUPROBOTMESSAGE COMMUNICATEWITHROBOT GLOBL: BASEAXIS1POS ROBOTCOMMANDCODE WRISTAXIS1POS	START: 306 ORCA3.CC ZYMATEHANDWAIT LOW BASEAXIS2POS ROBOTMESSAGE WRISTAXIS2POS	HIGH BASEAXIS3POS TEXT WRISTAXIS3POS
FUNCT: ZYMATEWAIT USERS: LOADDATABASEWAIT INITZYMATE CALLS: SETUPROBOTMESSAGE SHR REDOPOSITIONCONTROL GLOBL: ABORT DUMMYPTR ROBOTMESSAGE PARAM: WAITTYPE LOCAL: HOLDMSG	START: 328 ORCA3.CC MOVEZYMATE COMMUNICATEWITHROBOT TYPECRLF STOPANDREINITROBOT AXISERROR MAXRXWAIT TEXT THERMALMSG	INITZYMATEROBOT TYPEN RECEIVEMESSEGETIMEDWAIT BASESTATUS MOVING
: TESTZYMATEPOSITION : CALCULATEBASEAXISCOUNTS GLOBL: PENDINGANGLE	START: 432 ORCA3.CC BASEFKEYS PENDINGHEIGHT	PENDINGREACH
FUNCT: CALCULATEBASEAXISCOUNTS USERS: MOVEZYMATE CALLS: TESTZYMATEPOSITION	START: 473 ORCA3.CC DDIV	DMUL

G	DOUBLE ANGLECOUNTS CALFACTOR.HEIGHT CALFACTOR.REACHZERO PENDINGHEIGHT	UNSIGN CALFACTOR.ANGLE CALFACTOR.HEIGHTZERO HEIGHTCOUNTS PENDINGREACH	LOW CALFACTOR.ANGLEZERO CALFACTOR.REACH PENDINGANGLE REACHCOUNTS

FUNCT:	LOADDATABASE	START: 482 ORCA3.CC	
USERS:	LOADDATABASEWAIT MOVEZYMATETILLACKNOWLEDGE ZYMATPROGRAMMING	BASEFKEYS RACKSETUPSCREEN INITZYMATE COMMUNICATEWITHROBOT	MOVEZYMATE MOVETOLOCATIONSSCREEN
CALLS:	SETUPROBOTMESSAGE	TEXT	
GLOBL:	ROBOTMESSAGE	ANGLESPEED	HEIGHTACCEL
PARAM:	ANGLEACCEL HEIGHTSPEED TRANSOFFSET1	REACHACCEL TRANSOFFSET2	REACHSPEED TRANSOFFSET3

FUNCT:	MOVEZYMATE	START: 531 ORCA3.CC	
USERS:	STOPANDREINITROBOT DOBASEZEROS INITZYMATEROBOT INITZYMATE	BASEFKEYS CALIBRATIONSCREEN MOVETOLOCATIONSSCREEN	SETFACTORYCAL RACKSETUPSCREEN MOVETOCOORDINATESSCREEN
CALLS:	CALCULATEBASEAXISCOUNTS ZYMAWAIT	UNSIGN LOADDATABASE ANGLECOUNTS CALFACTOR.HEIGHT HEIGHT PENDINGANGLE RDIR REACHCOUNTS ROTARYACCEL VERTICALTRANSOFFSET	IABS DOPOSITIONCONTROL ANGLESPEED CALFACTOR.REACH HEIGHTCOUNTS PENDINGHEIGHT REACH REACHSPEED ROTARYTRANSOFFSET
GLOBL:	ANGLE CALFACTOR.ANGLE DIRECTPATH HEIGHTSPEED PENDINGREACH REACHACCEL REACHTRANSOFFSET VERTICALACCEL		
PARAM:	WAITTYPE	AXIS1SPEED DELTAANGLE HEIGHTCYCLES REACHCYCLES	AXIS2SPEED DELTAHEIGHT LONGESTCYCLES
LOCAL:	ANGLECYCLES AXIS3SPEED DELTAREACH MOVES		

T:	TESTHANDPOSITION	START: 685 ORCA3.CC	
J:	HANDFKEYS	CALCULATEHANDAXISCOUNTS	
GLOBL:	PENDINGGRIP	PENDINGSYRINGE	PENDINGWRIST

FUNCT:	CALCULATEHANDAXISCOUNTS	START: 748 ORCA3.CC	
USERS:	MOVEHAND	LOW	DOUBLE
CALLS:	TESTHANDPOSITION DDIV IABS	DMUL	UNSIGN
GLOBL:	CALFACTOR.GRIP CALFACTOR.SYRINGEZERO GRIPCOUNTS PENDINGWRIST	CALFACTOR.GRIPZERO CALFACTOR.WRIST PENDINGGRIP SYRINGECOUNTS	CALFACTOR.SYRINGE CALFACTOR.WRISTZERO PENDINGSYRINGE WRISTCOUNTS

FUNCT:	ZYMAHANDWAIT	START: 765 ORCA3.CC	
USERS:	LOADDATAWRISTWAIT MOVETOLOCATIONSSCREEN	MOVEHAND INITZYMATE COMMUNICATEWITHROBOT	INITZYMATEROBOT
CALLS:	SETUPROBOTMESSAGE TYPECLF STOPANDREINITROBOT	RECEIVEMESSAGETIMEDWAIT	TYPEN REDOPOSITIONCONTROL
GLOBL:	ABORT MAXRXWAIT TEXT	AXISERROR MOVING WRISTSTATUS	DUMMYPTR ROBOTMESSAGE
LOCAL:	HOLDMSG		

FUNCT:	MOVEHAND	START: 826 ORCA3.CC	
USERS:	STOPANDREINITROBOT DOWRISTZEROS MOVETOLOCATIONSSCREEN	HANDFKEYS WRISTCALIBRATIONSCREEN MOVETOCOORDINATESSCREEN	SETFACTORYCAL INITZYMATEROBOT INITZYMATE DOPOSITIONCONTROL PENDINGGRIP SYRINGE WRISTCOUNTS
CALLS:	CALCULATEHANDAXISCOUNTS	ZYMAHANDWAIT	
GLOBL:	GRIP PENDINGSYRINGE SYRINGECOUNTS	GRIPCOUNTS PENDINGWRIST WRIST	
PARAM:	WAITTYPE		

J:	LOADDATAWRIST	START: 841 ORCA3.CC	
USERS:	LOADDATAWRISTWAIT ZYMAHANDPROGRAMMING	HANDFKEYS INITZYMATE COMMUNICATEWITHROBOT	MOVETOLOCATIONSSCREEN
CALLS:	SETUPROBOTMESSAGE	TEXT	
GLOBL:	ROBOTMESSAGE	GRIPSPEED	SYRINGEACCEL
PARAM:	GRIPACCEL		

SYRINGESPEED	WRISTACCEL	WRISTSPEED
TOINTEGER GETBASEFORCEVALUES	START: 884 ORCA3.CC GETWRISTFORCEVALUES	
CALLS: SIGNED PARAM: BYTEIN		
FUNCT: GETBASEFORCEVALUES USERS: BASESENSESCREEN CALLS: SETUPROBOTMESSAGE GLOBL: ANGLEFORCE RDIR ROBOTMESSAGE	START: 915 ORCA3.CC INITZYMATE COMMUNICATEWITHROBOT BASESTATUS REACH TEXT	TOINTEGER HEIGHTFORCE REACHFORCE
FUNCT: GETWRISTFORCEVALUES USERS: HANDSENSESCREEN CALLS: SETUPROBOTMESSAGE DIVRND GLOBL: GRIPFORCE TEXT	START: 929 ORCA3.CC INITZYMATE COMMUNICATEWITHROBOT ROBOTMESSAGE WRISTFORCE	TOINTEGER SYRINGEFORCE WRISTSTATUS
FUNCT: TELLPOSITION USERS: STOPANDREINITROBOT CALIBRATIONSCREEN MOVETOLOCATIONSCREEN ZYMATEHANDPROGRAMMING CALLS: DISPLAY FDISPLAY GLOBL: ANGLE HEIGHT PENDINGHEIGHT PENDINGWRIST THREEDIGITFORMAT LOCAL: NUMBER	START: 968 ORCA3.CC BASEFKEYS RACKSETUPSCREEN RESTOREPOSITION ZYMATEPROGRAMMING UNSIGN IABS FIRSTDISPLAY PENDINGANGLE PENDINGREACH REACH TWODIGITFORMAT	HANDFKEYS WRISTCALIBRATIONSCREEN MOVETOCOORDINATESSCREEN SAR GRIP PENDINGGRIP PENDINGSYRINGE SYRINGE WRIST
FUNCT: DISPLAYNUMBER USERS: DISPLAYCURRENTGRIPFORCE CALLS: DISPLAY PARAM: COL LOCAL: BUFFER	START: 1073 ORCA3.CC DISPLAYBASEFORCES NUMBER	ROW

**C-DOC
CALLER/CALLED XREF**

Defined (Internal) Functions, Function XREF (of CALLS/USERS) (1 of 2)

: BASECOORDINATESCREEN FILE=ORCA1.CC			
USERS: 2177 ZYMATEPROGRAMMING	429 DISPLAY	430 DISPLAY	431 DISPLAY
CALLS: 427 CLEARFUNCTIONAREA	441 SIZE	441 FINDB	446 STORECOMMANDVARIABLE
440 BASEFKEYS			
452 STORECOMMANDVARIABLE			

FUNCT: BASEFKEYS FILE=ORCA2.CC			
USERS: 440 BASECOORDINATESCREEN	479 BASESPEEDSCREEN	523 BASESENSESCREEN	739 PROGRAMMINGCOMMANDSCREEN
CALLS: 412 FORCEUPPER	412 STROBECHAR	421 INPUT	430 LOADDATABASE
488 DISPLAY	492 TELLPOSITION	495 MOVEZYMAE	497 RECEIVEMESSAGETIMEDWAIT
505 STOPANDREINITROBOT			

FUNCT: BASEFUNCTIONSCREEN FILE=ORCA1.CC			
USERS: 2155 ZYMATEPROGRAMMING	2179 ZYMATEPROGRAMMING	2185 ZYMATEPROGRAMMING	2197 ZYMATEPROGRAMMING
2263 ZYMATEPROGRAMMING			
CALLS: 392 DISPLAY	393 DISPLAY	394 DISPLAY	395 DISPLAY
398 DISPLAY	399 DISPLAY	400 DISPLAY	401 DISPLAY
403 DISPLAY	404 DISPLAY		

FUNCT: BASESENSESCREEN FILE=ORCA1.CC			
USERS: 2195 ZYMATEPROGRAMMING			
CALLS: 507 CLEARFUNCTIONAREA	509 DISPLAY	510 DISPLAY	511 DISPLAY
514 DISPLAY	515 DISPLAY	518 LAST	523 BASEFKEYS
524 FINDB	525 GETBASEFORCEVALUES	526 DISPLAYBASEFORCES	531 STORECOMMANDVARIABLE
537 STORECOMMANDVARIABLE			

FUNCT: BASESPEEDSCREEN FILE=ORCA1.CC			
USERS: 2183 ZYMATEPROGRAMMING			
CALLS: 465 CLEARFUNCTIONAREA	467 DISPLAY	468 DISPLAY	469 DISPLAY
474 LAST	479 BASEFKEYS	480 FINDB	480 SIZE
488 STORECOMMANDVARIABLE	491 STORECOMMANDVARIABLE	494 STORECOMMANDVARIABLE	

: CALCULATEBASEAXISCOUNTS FILE=ORCA3.CC			
USERS: 559 MOVEZYMAE			
CALLS: 477 TESTZYMAEPOSITION	478 DDIV	478 DMUL	478 DOUBLE
478 LOW	479 DOUBLE	479 DMUL	479 LOW
479 DOUBLE	479 DDIV	480 DDIV	480 DMUL
480 UNSIGN	480 DOUBLE	480 LOW	

FUNCT: CALCULATEHANDAXISCOUNTS FILE=ORCA3.CC			
USERS: 831 MOVEHAND			
CALLS: 752 TESTHANDPOSITION	755 LOW	755 DOUBLE	755 DDIV
755 DOUBLE	759 LOW	759 UNSIGN	759 DMUL
759 DOUBLE	759 IABS	759 DOUBLE	762 DDIV
762 DOUBLE	762 DOUBLE	762 UNSIGN	762 LOW
763 DOUBLE	763 DDIV	763 DOUBLE	763 DMUL

FUNCT: CALIBRATIONSCREEN FILE=ORCA1.CC			
USERS: 2228 ZYMATEPROGRAMMING			
CALLS: 962 CLEARFUNCTIONAREA	964 DISPLAY	965 DISPLAY	966 DISPLAY
971 FORCEUPPER	979 DOCAL	980 LAST	980 DISPLAY
982 DISPLAY	982 LAST	992 CLEARFUNCTIONAREA	994 DISPLAY
996 DISPLAY	997 DOBASEZEROS	1005 CLEARFUNCTIONAREA	1006 DISPLAY
1008 FDISPLAY	1009 FDISPLAY	1010 FDISPLAY	1011 FDISPLAY
1013 FDISPLAY	1014 SETUPROBOTMESSAGE	1015 COMMUNICATEWITHROBOT	1018 SETUPROBOTMESSAGE
1021 DISPLAY	1022 FDISPLAY	1023 FDISPLAY	1024 FDISPLAY
1026 FDISPLAY	1027 FDISPLAY	1032 SETFACTORYCAL	1033 SAVECALIBRATIONDATA
1044 DISPLAY	1046 MOVEZYMAE	1049 TELLPOSITION	

FUNCT: CHANGELocationSCREEN FILE=ORCA1.CC			
USERS: 2111 ZYMATEHANDPROGRAMMING	2207 ZYMATEPROGRAMMING		
CALLS: 1962 UPDATELASTNAME	1963 FINPUT	1968 LOOKUPEXPSYMBOL	1974 DISPLAY
1984 DISPLAY	1985 SETRELATIVE	1988 DISPLAY	1989 SETHAND
1993 DISPLAY	1996 TYPEN	2000 TYPEN	2001 DISPLAY

FUNCT: CLEARFUNCTIONAREA FILE=ORCA1.CC			
USERS: 427 BASECOORDINATESCREEN	465 BASESPEEDSCREEN	507 BASESENSESCREEN	551 MONUMENTSCREEN
992 CALIBRATIONSCREEN	996 RACKSETUPSCREEN	1005 CALIBRATIONSCREEN	1067 WRISTCALIBRATIONSCREEN
1108 WRISTCALIBRATIONSCREEN	1157 HANDCOORDINATESCREEN	1195 HANDSPEEDSCREEN	1237 HANDSENSESCREEN
2015 DELETEDCOMMANDSCREEN	2060 ZYMATEHANDPROGRAMMING	2081 ZYMATEHANDPROGRAMMING	2087 ZYMATEHANDPROGRAMMING
2139 ZYMATEHANDPROGRAMMING	2178 ZYMATEPROGRAMMING	2184 ZYMATEPROGRAMMING	2196 ZYMATEPROGRAMMING
2244 ZYMATEPROGRAMMING	2262 ZYMATEPROGRAMMING		
CALLS: 216 DISPLAY	216 LAST	220 LAST	220 DISPLAY

FUNCT: CLEARKEYBOXES		FILE=ORCA1.CC		
U:	1348 HANDDEFINITIONSCREEN	1354 HANDDEFINITIONSCREEN	2058 ZYMATEHANDPROGRAMMING	2242 ZYMATEPROGRAMMING
C:	206 DISPLAY	206 LAST	207 DISPLAY	207 LAST

FUNCT: CLEARNAMEAREA		FILE=ORCA1.CC		
USERS:	552 MONUMENTSCREEN		228 LAST	228 DISPLAY
CALLS:	227 DISPLAY	227 LAST		

FUNCT: COMMUNICATEWITHROBOT		FILE=ORCA3.CC		
USERS:	99 GETPOSITION	289 DOPOSITIONCONTROL	318 REDOPOSITIONCONTROL	326 REDOPOSITIONCONTROL
	529 LOADDATABASE	776 ZYMATEHANDWAIT	780 GETCALIBRATIONDATA	784 GETCALIBRATIONDATA
	790 ZYMATEHANDWAIT	818 SAVECALIBRATIONDATA	821 SAVECALIBRATIONDATA	882 LOADDATAWRIST
	934 GETWRISTFORCEVALUES	1015 CALIBRATIONSCREEN	1019 CALIBRATIONSCREEN	1118 WRISTCALIBRATIONSCREEN
	1604 MOVETOLOCATIONSCREEN	1614 MOVETOLOCATIONSCREEN	1624 MOVETOLOCATIONSCREEN	2601 INITZYMATE
	2662 INITZYMATE			
CALLS:	231 COMPUTECHECKSUM	235 SENDMESSAGEILLGOODSTATUS	242 RETURNCHECKSUMOK	

FUNCT: COMPUTEABSOLUTE		FILE=ORCA2.CC		
USERS:	1536 MOVETOLOCATIONSCREEN	2506 INITZYMATE		
CALLS:	294 SAL	295 SAL	296 SAL	

FUNCT: COMPUTECHECKSUM		FILE=ORCA3.CC		
USERS:	231 COMMUNICATEWITHROBOT			
CALLS:				

FUNCT: COMPUTEHAND		FILE=ORCA2.CC		
USERS:	1548 MOVETOLOCATIONSCREEN	2514 INITZYMATE		
CALLS:	310 SAL	311 SAL	312 SAL	

FUNCT: COMPUTERACKLOCATION		FILE=ORCA2.CC		
USERS:	2526 INITZYMATE	2813 INITZYMATE		
CALLS:	1286 MOVETORACKINDEX	1290 GETRAM	1291 MOV	1292 LOOKUPEXPSYMBOL
	1296 FIX	1302 TYPES	1303 TYPEN	1304 TYPECLRF

FUNCT: COMPUTERELATIVE		FILE=ORCA2.CC		
USERS:	1542 MOVETOLOCATIONSCREEN	2510 INITZYMATE		
CALLS:	302 SAL	303 SAL	304 SAL	

FUNCT: DELETECOMMANDSCREEN		FILE=ORCA1.CC		
USERS:	2114 ZYMATEHANDPROGRAMMING	2224 ZYMATEPROGRAMMING		
CALLS:	2015 CLEARFUNCTIONAREA	2017 DISPLAY	2018 DISPLAY	2019 FINPUT
	2032 DISPLAY	2036 DELETEEXPSYMBOL	2039 DISPLAY	2043 DISPLAY

FUNCT: DISPLAYBASEFORCES		FILE=ORCA2.CC		
USERS:	526 BASESENSESCREEN			
CALLS:	637 DISPLAY	641 DISPLAY	644 IABS	644 UNSIGN
	652 DISPLAY	655 UNSIGN	655 IABS	656 DISPLAYNUMBER
	663 DISPLAY	666 IABS	666 UNSIGN	667 DISPLAYNUMBER

FUNCT: DISPLAYBASEFUNCTIONKEYS		FILE=ORCA1.CC		
USERS:	1349 HANDDEFINITIONSCREEN	2154 ZYMATEPROGRAMMING	2243 ZYMATEPROGRAMMING	
CALLS:	362 DISPLAY	363 DISPLAY	364 DISPLAY	365 DISPLAY
	368 DISPLAY	369 DISPLAY	370 DISPLAY	371 DISPLAY

FUNCT: DISPLAYCOLLISIONMESSAGE		FILE=ORCA2.CC		
USERS:	349 STOPANDREINITROBOT			
CALLS:	211 DISPLAY	217 TYPEN	221 SHR	223 TYPEN
	235 TYPEN	241 TYPEN	245 SHR	247 TYPEN
	253 TYPEN	259 TYPEN		

FUNCT: DISPLAYCURRENTGRIPFORCE		FILE=ORCA2.CC		
USERS:	1254 HANDSENSESCREEN			
CALLS:	620 DISPLAY	624 DISPLAY	627 UNSIGN	627 IABS

FUNCT: DISPLAYCURRENTHAND		FILE=ORCA2.CC		
USERS:	998 RACKSETUPSCREEN	1109 RACKSETUPSCREEN	1385 HANDDEFINITIONSCREEN	1408 INPUTANDMOVETORACKINDEX
CALLS:	883 DISPLAY	886 FDISPLAY		

FUNCT: DISPLAYHANDFUNCTIONKEYS		FILE=ORCA1.CC		
USERS:	1355 HANDDEFINITIONSCREEN	2059 ZYMATEHANDPROGRAMMING		
CALLS:	377 DISPLAY	378 DISPLAY	379 DISPLAY	380 DISPLAY
	383 DISPLAY	384 DISPLAY	385 DISPLAY	

FUNCT: DISPLAYMAINSRCEEN		FILE=ORCA1.CC		
USERS:	2153 ZYMATEPROGRAMMING			
CALLS:	336 DISPLAY	337 DISPLAY	338 DISPLAY	339 DISPLAY
	342 DISPLAY	343 DISPLAY	344 DISPLAY	345 DISPLAY
	347 DISPLAY	348 DISPLAY	349 DISPLAY	350 DISPLAY

	1170 HANDFKEYS	1171 SIZE	1171 FINDB	1176 STORECOMMANDVARIABLE

: HANDDEFINITIONSCREEN FILE=ORCA1.CC				
USERS:	2098 ZYMATEHANDPROGRAMMING			
CALLS:	1278 CLEARFUNCTIONAREA	1282 LOW	1283 HIGH	1285 LOOKUPEXPSYMBOL
	1296 LOOKUPEXPSYMBOL	1299 DISPLAY	1303 SAL	1304 SAL
	1309 DISPLAY	1310 DISPLAY	1311 FINPUT	1318 LOOKUPEXPSYMBOL
	1341 DISPLAY	1342 MOVEHANDTILLACKNOWLEDGE	1348 CLEARKEYBOXES	1349 DISPLAYBASEFUNCTIONKEYS
	1350 LAST	1351 DISPLAY	1351 LAST	1352 DISPLAY
	1354 CLEARKEYBOXES	1355 DISPLAYHANDFUNCTIONKEYS	1370 FLOAT	1370 COS
	1370 FIX	1372 FIX	1372 FLOAT	1372 SIN
	1373 GETDICTIONARYHANDOFFSETS	1374 MOVB	1375 SIZE	1375 SIZE
	1382 CHANGEEXPSYMBOL	1385 DISPLAYCURRENTHAND	1388 DISPLAY	1394 DISPLAY

FUNCT: HANDFKEYS FILE=ORCA2.CC				
USERS:	876 MOVEHANDTILLACKNOWLEDGE	1170 HANDCOORDINATESCREEN	1209 HANDSPEEDSCREEN	1251 HANDSENSESCREEN
CALLS:	513 STROBECHAR	513 FORCEUPPER	522 INPUT	531 LOADDATAWRIST
	574 DISPLAY	578 TELLPOSITION	581 MOVEHAND	583 RECEIVEMESSAGETIMEDWAIT
	591 STOPANDREINITROBOT			

FUNCT: HANDFUNCTIONSCREEN FILE=ORCA1.CC				
USERS:	2061 ZYMATEHANDPROGRAMMING	2082 ZYMATEHANDPROGRAMMING	2088 ZYMATEHANDPROGRAMMING	2094 ZYMATEHANDPROGRAMMING
CALLS:	411 DISPLAY	412 DISPLAY	413 DISPLAY	414 DISPLAY
	417 DISPLAY	418 DISPLAY	419 DISPLAY	420 DISPLAY

FUNCT: HANDSENSESCREEN FILE=ORCA1.CC				
USERS:	2092 ZYMATEHANDPROGRAMMING			
CALLS:	1237 CLEARFUNCTIONAREA	1239 DISPLAY	1240 DISPLAY	1241 DISPLAY
	1246 LAST	1251 HANDFKEYS	1252 FINDB	1252 SIZE
	1254 DISPLAYCURRENTGRIPFORCE	1259 STORECOMMANDVARIABLE	1262 STORECOMMANDVARIABLE	1265 STORECOMMANDVARIABLE

FUNCT: HANDSPEEDSCREEN FILE=ORCA1.CC				
USERS:	2086 ZYMATEHANDPROGRAMMING			
CALLS:	1195 CLEARFUNCTIONAREA	1197 DISPLAY	1198 DISPLAY	1199 DISPLAY
	1204 LAST	1209 HANDFKEYS	1210 SIZE	1210 FINDB
	1218 STORECOMMANDVARIABLE	1221 STORECOMMANDVARIABLE	1224 STORECOMMANDVARIABLE	

: INITZYMATE FILE=ORCA1.CC				
USERS:				
CALLS:	2357 GETRAM	2359 SIZE	2365 LOW	2366 HIGH
	2373 STOREEXPSYMBOL	2376 TYPEN	2377 TYPECRLF	2383 SIZE
	2388 CHANGEEXPSYMBOL	2391 TYPEN	2392 TYPECRLF	2394 FREERAM
	2413 LOADDATAWRIST	2414 LOADDATABASE	2419 RECEIVEMESSAGE	2430 SHR
	2451 CLEARSCREEN	2453 TYPEN	2457 TYPEN	2461 TYPEN
	2469 TYPEN	2471 TYPECRLF	2472 TYPEN	2476 FORCEUPPER
	2487 TYPECRLF	2488 RETURNTOEXEC	2497 GETRAM	2501 ZYMATEPROGRAMMING
	2506 COMPUTEABSOLUTE	2510 COMPUTERELATIVE	2514 COMPUTEHAND	2520 TYPEN
	2526 COMPUTERACKLOCATION	2549 TESTNEWFORPENDING	2550 RANGECHECKPOSITION	2551 FIX
	2562 TESTNEWFORPENDING	2563 RANGECHECKPOSITION	2564 FIX	2568 FLOAT
	2576 RANGECHECKPOSITION	2577 FIX	2581 FLOAT	2596 FIX
	2598 SETUPROBOTMESSAGE	2601 COMMUNICATEWITHROBOT	2604 GETPOSITION	2610 STOPMONITOR
	2618 RECEIVEMESSAGETIMEDWAIT	2619 GETWRISTFORCEVALUES	2620 FLOAT	2635 FIX
	2637 VIBRATORUNITS	2638 COMMUNICATEWITHROBOT	2642 FLOAT	2657 FIX
	2662 COMMUNICATEWITHROBOT	2666 FLOAT	2673 RANGECHECKEDSPEEDIN	2677 LOADDATABASEWAIT
	2681 FLOAT	2688 RANGECHECKEDSPEEDIN	2689 LOADDATABASEWAIT	2693 FLOAT
	2700 RANGECHECKEDSPEEDIN	2701 LOADDATABASEWAIT	2705 SIGNED	2705 FLOAT
	2713 LOADDATABASEWAIT	2717 FLOAT	2717 SIGNED	2724 RANGECHECKEDSPEEDIN
	2729 SIGNED	2729 FLOAT	2736 RANGECHECKEDSPEEDIN	2737 LOADDATAWRISTWAIT
	2741 FLOAT	2748 RANGECHECKEDSPEEDIN	2749 LOADDATAWRISTWAIT	2753 FLOAT
	2764 GETWRISTFORCEVALUES	2776 ZYMATEWAIT	2777 RECEIVEMESSAGETIMEDWAIT	2778 GETBASEFORCEVALUES
	2782 ZYMATEWAIT	2783 RECEIVEMESSAGETIMEDWAIT	2784 GETBASEFORCEVALUES	2785 FLOAT
	2789 RECEIVEMESSAGETIMEDWAIT	2790 GETBASEFORCEVALUES	2791 FLOAT	2794 GETRAM
	2799 LOOKUPEXPSYMBOL	2804 SAL	2805 SAL	2806 SAL
	2827 TYPEN	2828 TYPECRLF	2836 TYPEN	2837 TYPECRLF
	2847 LOADDATABASEWAIT	2863 GETDICTIONARYHANDOFFSETS	2865 MOVB	2871 TESTNEWFORPENDING
	2873 FIX	2877 FLOAT	2884 TESTNEWFORPENDING	2885 RANGECHECKPOSITION
	2891 GETPOSITION	2892 FLOAT	2899 TESTNEWFORPENDING	2900 RANGECHECKPOSITION
	2905 FLOAT	2914 RETURNTOEXEC	2920 ZYMATEWAIT	2925 MOVEZYMATE
	2938 ZYMATEHANDWAIT	2943 MOVEHAND	2946 ZYMATEHANDWAIT	2954 RETURNTOEXEC
	2965 RETURNTOEXEC			

: INITZYMATEROBOT FILE=ORCA2.CC				
USERS:	2412 INITZYMATE			
CALLS:	1338 GETRAM	1338 SIZE	1340 CREATEEXCHANGE	1342 RESETMESSAGEAREAANDUART
	1355 GETRAM	1356 MOVB	1358 CURRENTCS	1363 CREATETASK
	1366 GETCALIBRATIONDATA	1368 SETFACTORYCAL	1373 LAST	1386 GETPOSITION
	1391 GETPOSITION	1394 MOVEHAND	1400 ZYMATEWAIT	1401 ZYMATEHANDWAIT

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354 DISPLAY	356 DISPLAY		
DISLAYNUMBER S: 628 DISPLAYCURRENTGRIPFORCE CALLS: 1088 DISPLAY	FILE=ORCA3.CC 645 DISPLAYBASEFORCES	656 DISPLAYBASEFORCES	667 DISPLAYBASEFORCES
FUNCT: DIVRND USERS: 935 GETWRISTFORCEVALUES CALLS:	FILE=ORCA3.CC 936 GETWRISTFORCEVALUES	937 GETWRISTFORCEVALUES	2597 INITZYMATE
FUNCT: DOBASEZEROS USERS: 997 CALIBRATIONSCREEN CALLS: 839 STROBECHAR	FILE=ORCA1.CC 839 FORCEUPPER	848 INPUT	881 MOVEZYMATE
FUNCT: DOCAL USERS: 979 CALIBRATIONSCREEN CALLS: 776 STROBECHAR 804 LOW 804 DOUBLE 805 SIGNED	FILE=ORCA1.CC 981 CALIBRATIONSCREEN 780 VALUEENTERED 804 DOUBLE 805 UNSIGN 805 SIGNED	1083 WRISTCALIBRATIONSCREEN 788 ASCIIITOREAL 804 UNSIGN 805 UNSIGN 808 SIGNED	1085 WRISTCALIBRATIONSCREEN 801 FIX 804 DDIV 805 SIGNED 813 DISPLAY
FUNCT: DOPOSITIONCONTROL USERS: 680 MOVEZYMATE CALLS: 282 SETUPROBOTMESSAGE 288 HIGH	FILE=ORCA3.CC 836 MOVEHAND 283 LOW 289 COMMUNICATEWITHROBOT	284 HIGH 290 STOPMONITOR	285 LOW
FUNCT: DOWRISTZEROS USERS: 1100 WRISTCALIBRATIONSCREEN CALLS: 906 STROBECHAR	FILE=ORCA1.CC 906 FORCEUPPER	915 INPUT	948 MOVEHAND
FUNCT: FORCEUPPER USERS: 412 BASEFKEYS 971 CALIBRATIONSCREEN 2256 ZYMATEPROGRAMMING CALLS:	FILE=ORCA2.CC 513 HANDFKEYS 1017 RACKSETUPSCREEN 2476 INITZYMATE	593 MONUMENTSCREEN 1048 RACKSETUPSCREEN	608 MONUMENTSCREEN 1075 WRISTCALIBRATIONSCREEN
FUNCT: GETBASEFORCEVALUES USERS: 525 BASESENSESCREEN CALLS: 919 SETUPROBOTMESSAGE	FILE=ORCA3.CC 2778 INITZYMATE 920 COMMUNICATEWITHROBOT	2784 INITZYMATE 921 TOINTEGER	2790 INITZYMATE 922 TOINTEGER
FUNCT: GETCALIBRATIONDATA USERS: 1366 INITZYMATEROBOT CALLS: 779 SETUPROBOTMESSAGE 788 COMMUNICATEWITHROBOT	FILE=ORCA2.CC 780 COMMUNICATEWITHROBOT 789 MOVW	783 SETUPROBOTMESSAGE	784 COMMUNICATEWITHROBOT
FUNCT: GETDICTIONARYHANDOFFSETS USERS: 1077 RACKSETUPSCREEN CALLS: 893 SAL	FILE=ORCA2.CC 1373 HANDDEFINITIONSCREEN 894 SAL	1740 MOVETOLOCATIONSCREEN 895 SAL	2863 INITZYMATE
FUNCT: GETPOSITION USERS: 361 STOPANDREINITROBOT CALLS: 98 SETUPROBOTMESSAGE 111 LOW 120 SIGNED 129 DDIV 139 LOW 143 DDIV 143 DMUL 152 SIGNED 173 DDIV	FILE=ORCA2.CC 362 STOPANDREINITROBOT 99 COMMUNICATEWITHROBOT 111 SIGNED 120 DDIV 129 DMUL 139 DOUBLE 143 DOUBLE 152 DDIV 152 DOUBLE 173 DOUBLE	1386 INITZYMATEROBOT 111 DDIV 120 DMUL 120 DOUBLE 129 SIGNED 139 SIGNED 143 LOW 152 DOUBLE 173 DOUBLE 173 DMUL	1391 INITZYMATEROBOT 111 DOUBLE 120 DOUBLE 129 DOUBLE 129 DOUBLE 139 DOUBLE 143 SIGNED 152 DMUL 173 SIGNED
FUNCT: GETSCALEDATA USERS: 1567 MOVETOLOCATIONSCREEN 1597 MOVETOLOCATIONSCREEN CALLS: 1436 FIX	FILE=ORCA1.CC 1572 MOVETOLOCATIONSCREEN 1619 MOVETOLOCATIONSCREEN	1577 MOVETOLOCATIONSCREEN 1748 MOVETOLOCATIONSCREEN	1582 MOVETOLOCATIONSCREEN 1753 MOVETOLOCATIONSCREEN
FUNCT: GETSCALEDRM1 USERS: 1902 MOVETOCOORDINATESSCREEN CALLS: 1875 ASCIIITOREAL	FILE=ORCA1.CC 1911 MOVETOCOORDINATESSCREEN 1876 FLOAT	1920 MOVETOCOORDINATESSCREEN 1878 FLOAT	1929 MOVETOCOORDINATESSCREEN 1882 FLOAT
FUNCT: GETWRISTFORCEVALUES USERS: 1253 HANDSENSESCREEN CALLS: 933 SETUPROBOTMESSAGE 937 TOINTEGER	FILE=ORCA3.CC 2619 INITZYMATE 934 COMMUNICATEWITHROBOT 937 DIVRND	2764 INITZYMATE 935 TOINTEGER	935 DIVRND
FUNCT: HANDCOORDINATESCREEN USERS: 2080 ZYMATEHANDPROGRAMMING CALLS: 1157 CLEARFUNCTIONAREA	FILE=ORCA1.CC 1159 DISPLAY	1160 DISPLAY	1161 DISPLAY

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F      INPUTANDMOVETORACKINDEX      FILE=ORCA1.CC
:      1553 MOVETOLOCATIONSSCREEN      1694 MOVETOLOCATIONSSCREEN
:      1408 DISPLAYCURRENTHAND      1409 DISPLAY      1410 FINPUT      1417 MOVETORACKINDEX
-----
FUNCT: LOADDATABASE      FILE=ORCA3.CC
USERS: 173 LOADDATABASEWAIT      430 BASEFKEYS      435 BASEFKEYS      678 MOVEZYMATE
      1633 MOVETOLOCATIONSSCREEN      1639 MOVETOLOCATIONSSCREEN      1645 MOVETOLOCATIONSSCREEN      1651 MOVETOLOCATIONSSCREEN
      2414 INITZYMATE
CALLS: 495 SETUPROBOTMESSAGE      529 COMMUNICATEWITHROBOT
-----
FUNCT: LOADDATABASEWAIT      FILE=ORCA1.CC
USERS: 2677 INITZYMATE      2689 INITZYMATE      2701 INITZYMATE      2713 INITZYMATE
CALLS: 172 ZYMAWAIT      173 LOADDATABASE
-----
FUNCT: LOADDATAWRIST      FILE=ORCA3.CC
USERS: 185 LOADDATAWRISTWAIT      531 HANDFKEYS      536 HANDFKEYS      1657 MOVETOLOCATIONSSCREEN
      2076 ZYMAHANDPROGRAMMING      2413 INITZYMATE
CALLS: 851 SETUPROBOTMESSAGE      882 COMMUNICATEWITHROBOT
-----
FUNCT: LOADDATAWRISTWAIT      FILE=ORCA1.CC
USERS: 2725 INITZYMATE      2737 INITZYMATE      2749 INITZYMATE
CALLS: 184 ZYMAHANDWAIT      185 LOADDATAWRIST
-----
FUNCT: MONUMENTSCREEN      FILE=ORCA1.CC
USERS: 2214 ZYMAHANDPROGRAMMING
CALLS: 551 CLEARFUNCTIONAREA      552 CLEARNAMEAREA      553 UPDTELASTNAME      554 LAST
      560 LOW      561 HIGH      563 LOOKUPEXPSYMBOL      567 FINDSYMBOL
      587 DISPLAY      588 FDISPLAY      589 DISPLAY      593 FORCEUPPER
      602 TYPECHAR      604 DISPLAY      608 FORCEUPPER      608 GETCHAR
      635 DISPLAY      636 MOVEZYMATETILLACKNOWLEDGE      643 DISPLAY      644 FINPUT
      650 STOREEXPSYMBOL      654 CHANGEEXPSYMBOL      659 DISPLAY      670 MOV
      676 SIZE      676 SIZE      688 DISPLAY      698 SETABSOLUTE
      705 CHANGEEXPSYMBOL      708 LAST      708 DISPLAY      711 DISPLAY
-----
T: MOVEHAND      FILE=ORCA3.CC
S: 380 STOPANDREINITROBOT      581 HANDFKEYS      851 SETFACTORYCAL      948 DOWRISTZEROS
      1764 MOVETOLOCATIONSSCREEN      1950 MOVETOCOORDINATESSCREEN      2943 INITZYMATE
CALLS: 831 CALCULATEHANDAXISCOUNTS      834 ZYMAHANDWAIT      836 DOPOSITIONCONTROL
-----
FUNCT: MOVEHANDTILLACKNOWLEDGE      FILE=ORCA2.CC
USERS: 1342 HANDDEFINITIONSSCREEN
CALLS: 876 HANDFKEYS
-----
FUNCT: MOVETOCOORDINATESSCREEN      FILE=ORCA1.CC
USERS: 2108 ZYMAHANDPROGRAMMING      2204 ZYMAHANDPROGRAMMING
CALLS: 1894 UPDTELASTNAME      1895 VALUEENTERED      1899 RESTOREPOSITION      1902 GETSCALEDNR1
      1911 GETSCALEDNR1      1913 VALUEENTERED      1917 RESTOREPOSITION      1920 GETSCALEDNR1
      1926 RESTOREPOSITION      1929 GETSCALEDNR1      1931 VALUEENTERED      1935 RESTOREPOSITION
      1940 VALUEENTERED      1944 RESTOREPOSITION      1947 GETSCALEDNR1      1949 MOVEZYMATE
      1953 DISPLAY      1956 TELLPOSITION
-----
FUNCT: MOVETOLOCATIONSSCREEN      FILE=ORCA1.CC
USERS: 2105 ZYMAHANDPROGRAMMING      2201 ZYMAHANDPROGRAMMING
CALLS: 1464 UPDTELASTNAME      1465 LAST      1465 DISPLAY      1466 DISPLAY
      1474 MOV      1479 FINDSYMBOL      1482 MOV      1488 DISPLAY
      1495 VALUEENTERED      1497 ASCIIOTREAL      1535 DISPLAY      1536 COMPUTEABSOLUTE
      1542 COMPUTERELATIVE      1547 DISPLAY      1548 COMPUTEHAND      1553 INPUTANDMOVETORACKINDEX
      1567 GETSCALEDNR1      1571 RANGECHECKVALUE      1572 GETSCALEDNR1      1576 RANGECHECKVALUE
      1581 RANGECHECKVALUE      1582 GETSCALEDNR1      1586 RANGECHECKVALUE      1587 GETSCALEDNR1
      1592 GETSCALEDNR1      1596 RANGECHECKVALUE      1597 GETSCALEDNR1      1601 SETUPROBOTMESSAGE
      1605 ZYMAHANDWAIT      1610 RANGECHECKVALUE      1611 FIX      1612 SETUPROBOTMESSAGE
      1614 COMMUNICATEWITHROBOT      1618 RANGECHECKVALUE      1619 GETSCALEDNR1      1621 SETUPROBOTMESSAGE
      1628 FLOAT      1628 RANGECHECKVALUE      1628 RANGECHECKVALUE      1629 FIX
      1633 LOADDATABASE      1637 RANGECHECKVALUE      1637 FLOAT      1637 FLOAT
      1638 UNSIGN      1639 LOADDATABASE      1643 FLOAT      1643 RANGECHECKVALUE
      1644 FIX      1644 UNSIGN      1645 LOADDATABASE      1649 FLOAT
      1649 FLOAT      1650 UNSIGN      1650 FIX      1651 LOADDATABASE
      1655 FLOAT      1655 FLOAT      1656 FIX      1656 UNSIGN
      1661 RANGECHECKVALUE      1661 FLOAT      1666 FIX      1662 FIX
      1663 LOADDATAWRIST      1667 RANGECHECKVALUE      1667 FLOAT      1667 FLOAT
      1668 UNSIGN      1669 LOADDATAWRIST      1673 UPDTELASTNAME      1674 FINPUT
      1678 LOOKUPEXPSYMBOL      1684 SAL      1685 SAL      1686 SAL
      1694 INPUTANDMOVETORACKINDEX      1703 DISPLAY      1711 DISPLAY      1740 GETDICTIONARYHANDOFFSETS
      1743 DISPLAYCURRENTHAND      1747 RANGECHECKVALUE      1748 GETSCALEDNR1      1752 RANGECHECKVALUE
      1757 RANGECHECKVALUE      1758 GETSCALEDNR1      1763 MOVEZYMATE      1764 MOVEHAND
      1774 DISPLAY      1785 DISPLAY      1788 DISPLAY      1791 DISPLAY
      1797 DISPLAY      1800 DISPLAY      1809 DISPLAY      1812 DISPLAY

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1824 TELLPOSITION 1841 FDISPLAY	1829 MOV 1845 DISPLAY	1830 REALTOASCII 1851 DISPLAY	1834 MOV

: MOVETORACKINDEX FILE=ORCA2.CC			
USERS: 1120 RACKSETUPSCREEN	1156 RACKSETUPSCREEN	1197 RACKSETUPSCREEN	1286 COMPUTERACKLOCATION
CALLS: 910 FIX	919 TYPEN	920 TYPECRLF	925 DISPLAY
933 SIGNED	933 FLOAT	934 FLOAT	934 SIGNED
934 SIGNED	935 SIGNED	935 FLOAT	935 FLOAT
937 FIX	941 SORT	942 ATAN	943 FLOAT
944 COS	950 FIX	955 FIX	964 FIX

FUNCT: MOVEZYMATE FILE=ORCA3.CC			
USERS: 379 STOPANDREINITROBOT	495 BASEFKEYS	838 SETFACTORYCAL	881 DOBASEZEROS
1158 RACKSETUPSCREEN	1199 RACKSETUPSCREEN	1390 INITZYMATEROBOT	1763 MOVETOLOCATIONSSCREEN
2925 INITZYMATE			
CALLS: 559 CALCULATEBASEAXISCOUNTS	576 UNSIGN	576 IABS	577 IABS
578 IABS	674 ZYMAWAIT	678 LOADDATABASE	680 DOPOSITIONCONTROL

FUNCT: MOVEZYMATETILLACKNOWLEDGE FILE=ORCA2.CC			
USERS: 636 MONUMENTSCREEN	1115 RACKSETUPSCREEN	1126 RACKSETUPSCREEN	1163 RACKSETUPSCREEN
1353 HANDDEFINITIONSSCREEN			
CALLS: 863 BASEFKEYS	866 LOADDATABASE		

FUNCT: PROGRAMMINGCOMMANDSCREEN FILE=ORCA1.CC			
USERS: 2218 ZYMAEPROGRAMMING			
CALLS: 724 CLEARFUNCTIONAREA	726 DISPLAY	727 DISPLAY	728 DISPLAY
731 DISPLAY	734 LAST	739 BASEFKEYS	740 FINDB
745 STOREIMMEDIATECOMMAND	748 STOREIMMEDIATECOMMAND	751 STOREIMMEDIATECOMMAND	754 STOREIMMEDIATECOMMAND

FUNCT: RACKSETUPSCREEN FILE=ORCA2.CC			
USERS: 2210 ZYMAEPROGRAMMING			
CALLS: 995 GETRAM	996 CLEARFUNCTIONAREA	997 UPDTELASTNAME	998 DISPLAYCURRENTHAND
1005 LOOKUPEXPSYMBOL	1016 DISPLAY	1017 FORCEUPPER	1017 GETCHAR
1035 DISPLAY	1039 DISPLAY	1047 DISPLAY	1048 FORCEUPPER
1056 DISPLAY	1057 FINPUT	1063 DISPLAY	1067 FINPUT
1068 LAST	1071 LOOKUPEXPSYMBOL	1077 GETDICTIONARYHANDOFFSETS	1078 MOV
1089 DISPLAY	1098 FDISPLAY	1109 DISPLAYCURRENTHAND	1111 LOADDATABASE
1115 MOVEZYMATETILLACKNOWLEDGE	1120 MOVETORACKINDEX	1121 TELLPOSITION	1122 MOVEZYMATE
1124 DISPLAY	1125 DISPLAY	1126 MOVEZYMATETILLACKNOWLEDGE	1131 FLOAT
1132 SORT	1133 FLOAT	1133 ATAN	1133 FLOAT
1135 SIN	1136 FLOAT	1137 DISPLAY	1141 FDISPLAY
1156 MOVETORACKINDEX	1157 TELLPOSITION	1158 MOVEZYMATE	1160 DISPLAY
1162 DISPLAY	1163 MOVEZYMATETILLACKNOWLEDGE	1168 FLOAT	1169 SORT
1170 FLOAT	1170 FLOAT	1170 ATAN	1171 FLOAT
1173 COS	1174 SIN	1175 FLOAT	1176 DISPLAY
1185 FINPUT	1197 MOVETORACKINDEX	1198 TELLPOSITION	1199 MOVEZYMATE
1202 FDISPLAY	1203 DISPLAY	1204 MOVEZYMATETILLACKNOWLEDGE	1209 FLOAT
1210 FLOAT	1211 ATAN	1211 FLOAT	1211 FLOAT
1212 FLOAT	1213 FLOAT	1213 SIGNED	1213 COS
1214 SIN	1214 FLOAT	1215 SIGNED	1215 FLOAT
1240 DISPLAY	1241 MOVEZYMATETILLACKNOWLEDGE	1246 FLOAT	1248 SIZE
1256 STOREEXPSYMBOL	1260 CHANGEEXPSYMBOL	1265 DISPLAY	1269 DISPLAY

FUNCT: RANGECHECKSPEEDIN FILE=ORCA1.CC			
USERS: 2673 INITZYMATE	2688 INITZYMATE	2700 INITZYMATE	2712 INITZYMATE
2748 INITZYMATE			
CALLS: 2289 FLOAT	2289 SIGNED	2291 FLOAT	2291 SIGNED
2297 SIGNED	2297 FLOAT	2301 FIX	2301 UNSIGN

FUNCT: RANGECHECKPOSITION FILE=ORCA1.CC			
USERS: 2550 INITZYMATE	2563 INITZYMATE	2576 INITZYMATE	2872 INITZYMATE
CALLS:			

FUNCT: RANGECHECKVALUE FILE=ORCA1.CC			
USERS: 1566 MOVETOLOCATIONSSCREEN	1571 MOVETOLOCATIONSSCREEN	1576 MOVETOLOCATIONSSCREEN	1581 MOVETOLOCATIONSSCREEN
1596 MOVETOLOCATIONSSCREEN	1610 MOVETOLOCATIONSSCREEN	1618 MOVETOLOCATIONSSCREEN	1628 MOVETOLOCATIONSSCREEN
1643 MOVETOLOCATIONSSCREEN	1649 MOVETOLOCATIONSSCREEN	1655 MOVETOLOCATIONSSCREEN	1661 MOVETOLOCATIONSSCREEN
1747 MOVETOLOCATIONSSCREEN	1752 MOVETOLOCATIONSSCREEN	1757 MOVETOLOCATIONSSCREEN	
CALLS:			

FUNCT: REDOPOSITIONCONTROL FILE=ORCA3.CC			
: 416 ZYMAWAIT	793 ZYMAHANDWAIT		
: 311 SETUPROBOTMESSAGE	312 LOW	313 HIGH	314 LOW
317 HIGH	318 COMMUNICATEWITHROBOT	319 SETUPROBOTMESSAGE	320 LOW
322 LOW	323 HIGH	324 LOW	325 HIGH

FUNCT: RESETMESSAGEAREAANDUART FILE=ORCA3.CC			
USERS: 167 SENDMESSAGETILLGOODSTATUS	1342 INITZYMATEROBOT		

CALLS:	118 TIME 134 TIME	122 TIME	125 TIME	127 TIME

FUNCT:	RESTOREPOSITION	FILE=ORCA1.CC		
USERS:	1899 MOVETOCOORDINATESSCREEN	1908 MOVETOCOORDINATESSCREEN	1917 MOVETOCOORDINATESSCREEN	1926 MOVETOCOORDINATESSCREEN
	2232 ZYMATEPROGRAMMING			
CALLS:	1866 TELLPOSITION			

FUNCT:	RETURNCHECKSUMOK	FILE=ORCA3.CC		
USERS:	242 COMMUNICATEWITHROBOT			
CALLS:				

FUNCT:	RETURNTOEXEC	FILE=ORCA1.CC		
USERS:	2488 INITZYMATE	2914 INITZYMATE	2954 INITZYMATE	2959 INITZYMATE
CALLS:	2342 SENDMESSAGE			

FUNCT:	SAVECALIBRATIONDATA	FILE=ORCA2.CC		
USERS:	1033 CALIBRATIONSCREEN	1043 CALIBRATIONSCREEN	1136 WRISTCALIBRATIONSCREEN	1146 WRISTCALIBRATIONSCREEN
CALLS:	816 SETUPROBOTMESSAGE	817 MOVH	818 COMMUNICATEWITHROBOT	819 SETUPROBOTMESSAGE

FUNCT:	SENDMESSAGEILLGOODSTATUS	FILE=ORCA3.CC		
USERS:	235 COMMUNICATEWITHROBOT			
CALLS:	160 SENDMESSAGE	161 RECEIVEMESSAGE	167 RESETMESSAGEAREAANDUART	172 CLEARSCREEN
	175 FDISPLAY	179 RELEASE		

FUNCT:	SETABSOLUTE	FILE=ORCA2.CC		
USERS:	698 MONUMENTSCREEN	761 STOREROBOTPOSITION	1981 CHANGELOCATIONSCREEN	
CALLS:	268 SAR	270 SAR	272 SAR	

FUNCT:	SETFACTORYCAL	FILE=ORCA2.CC		
USERS:	1032 CALIBRATIONSCREEN	1135 WRISTCALIBRATIONSCREEN	1368 INITZYMATEROBOT	
CALLS:	838 MOVEZYMATE	851 MOVEHAND		

FUNCT:	SETHAND	FILE=ORCA2.CC		
USERS:	755 STOREROBOTPOSITION	1989 CHANGELOCATIONSCREEN		
S:	286 SAR	287 SAR	288 SAR	

FUNCT:	SETRELATIVE	FILE=ORCA2.CC		
USERS:	766 STOREROBOTPOSITION	1985 CHANGELOCATIONSCREEN		
CALLS:	278 SAR	279 SAR	280 SAR	

FUNCT:	SETUPROBOTMESSAGE	FILE=ORCA3.CC		
USERS:	98 GETPOSITION	282 DOPOSITIONCONTROL	311 REDOPOSITIONCONTROL	319 REDOPOSITIONCONTROL
	358 ZYMATEWAIT	495 LOADDATABASE	774 ZYMATEHANDWAIT	779 GETCALIBRATIONDATA
	787 GETCALIBRATIONDATA	816 SAVECALIBRATIONDATA	819 SAVECALIBRATIONDATA	851 LOADDATAWRIST
	933 GETWRISTFORCEVALUES	1014 CALIBRATIONSCREEN	1018 CALIBRATIONSCREEN	1117 WRISTCALIBRATIONSCREEN
	1601 MOVETOLOCATIONSCREEN	1612 MOVETOLOCATIONSCREEN	1621 MOVETOLOCATIONSCREEN	2598 INITZYMATE
CALLS:	2659 INITZYMATE			
	146 SIZE			

FUNCT:	STOPANDREINITROBOT	FILE=ORCA2.CC		
USERS:	422 ZYMATEWAIT	505 BASEFKEYS	591 HANDFKEYS	800 ZYMATEHANDWAIT
CALLS:	338 TYPEN	342 DISPLAY	349 DISPLAYCOLLISIONMESSAGE	352 TYPEN
	361 GETPOSITION	362 GETPOSITION	373 TELLPOSITION	379 MOVEZYMATE
	383 STROBEKEYPAD	386 STROBEKEYPAD	389 DISPLAY	389 LAST

FUNCT:	STOPMONITOR	FILE=ORCA3.CC		
USERS:	290 DOPOSITIONCONTROL	2610 INITZYMATE		
CALLS:	256 SENDMESSAGE			

FUNCT:	STOPPROGRAM	FILE=ORCA2.CC		
USERS:				
CALLS:	1412 GETRAM	1412 SIZE	1429 SIZE	1436 RECEIVEMESSAGE
	1446 RECEIVEMESSAGE			

FUNCT:	STOREANDCHECKSYMBOL	FILE=ORCA2.CC		
USERS:	712 STORECOMMANDVARIABLE	733 STOREIMMEDIATECOMMAND	772 STOREROBOTPOSITION	
CALLS:	673 MOVH	674 STOREEXPSYMBOL	677 DISPLAY	683 DISPLAY

FUNCT:	STORECOMMANDVARIABLE	FILE=ORCA2.CC		
USERS:	446 BASECOORDINATESCREEN	449 BASECOORDINATESCREEN	452 BASECOORDINATESCREEN	485 BASESPEEDSCREEN
	494 BASESPEEDSCREEN	531 BASESENSESCREEN	534 BASESENSESCREEN	537 BASESENSESCREEN
	1179 HANDCOORDINATESCREEN	1182 HANDCOORDINATESCREEN	1215 HANDSPEEDSCREEN	1218 HANDSPEEDSCREEN
	1224 HANDSPEEDSCREEN	1259 HANDSENSESCREEN	1262 HANDSENSESCREEN	1265 HANDSENSESCREEN
CALLS:	701 DISPLAY	701 LAST	702 FINPUT	705 SIZE

FUNCT:	STOREIMMEDIATECOMMAND	FILE=ORCA2.CC		
USERS:	745 PROGRAMMINGCOMMANDSCREEN	748 PROGRAMMINGCOMMANDSCREEN	751 PROGRAMMINGCOMMANDSCREEN	754 PROGRAMMINGCOMMANDSCREEN

CALLS:	722 DISPLAY	722 LAST	723 FINPUT	726 SIZE
F :	STOREROBOTPOSITION	FILE=ORCA2.CC		
:	2102 ZYMATEHANDPROGRAMMING	2189 ZYMATEPROGRAMMING	2192 ZYMATEPROGRAMMING	745 SIZE
CALLS:	741 UPDATELASTNAME	742 FINPUT	766 SETRELATIVE	767 DISPLAY
	761 SETABSOLUTE	762 DISPLAY		
FUNCT:	TELLPOSITION	FILE=ORCA3.CC		
USERS:	373 STOPANDREINITROBOT	492 BASEFKEYS	578 HANDFKEYS	1049 CALIBRATIONSCREEN
	1157 RACKSETUPSCREEN	1198 RACKSETUPSCREEN	1824 MOVETOLOCATIONSCREEN	1866 RESTOREPOSITION
	2063 ZYMATEHANDPROGRAMMING	2157 ZYMATEPROGRAMMING		
CALLS:	979 DISPLAY	983 DISPLAY	984 UNSIGN	984 SAR
	997 DISPLAY	998 SAR	998 UNSIGN	999 FDISPLAY
	1011 DISPLAY	1012 UNSIGN	1012 SAR	1013 FDISPLAY
	1027 DISPLAY	1028 IABS	1028 UNSIGN	1028 SAR
	1030 DISPLAY	1034 DISPLAY	1035 UNSIGN	1035 SAR
	1037 DISPLAY	1047 DISPLAY	1051 DISPLAY	1052 UNSIGN
	1053 FDISPLAY	1061 DISPLAY	1065 DISPLAY	1066 UNSIGN
	1067 FDISPLAY			
FUNCT:	TESTHANDPOSITION	FILE=ORCA3.CC		
USERS:	568 HANDFKEYS	752 CALCULATEHANDAXISCOUNTS		
CALLS:				
FUNCT:	TESTNEWFORPENDING	FILE=ORCA1.CC		
USERS:	2549 INITZYMATE	2562 INITZYMATE	2575 INITZYMATE	2871 INITZYMATE
CALLS:				
FUNCT:	TESTZYMATEPOSITION	FILE=ORCA3.CC		
USERS:	477 CALCULATEBASEAXISCOUNTS	482 BASEFKEYS		
CALLS:				
FUNCT:	TOINTEGER	FILE=ORCA3.CC		
USERS:	921 GETBASEFORCEVALUES	922 GETBASEFORCEVALUES	923 GETBASEFORCEVALUES	935 GETWRISTFORCEVALUES
CALLS:	891 SIGNED	895 SIGNED		
FUNCT:	UPDATELASTNAME	FILE=ORCA2.CC		
:	553 MONUMENTSCREEN	741 STOREROBOTPOSITION	997 RACKSETUPSCREEN	1464 MOVETOLOCATIONSCREEN
	1962 CHANGELOCATIONSCREEN	2158 ZYMATEPROGRAMMING		
CALLS:	600 LAST	600 DISPLAY	601 DISPLAY	601 LAST
	603 LAST	603 DISPLAY	604 FDISPLAY	605 LAST
FUNCT:	VALUEENTERED	FILE=ORCA1.CC		
USERS:	780 DOCLAL	1495 MOVETOLOCATIONSCREEN	1895 MOVETOCOORDINATESSCREEN	1904 MOVETOCOORDINATESSCREEN
	1931 MOVETOCOORDINATESSCREEN	1940 MOVETOCOORDINATESSCREEN		
CALLS:	267 CURSORON	268 DISPLAY	272 GETCHAR	276 CURSOROFF
	289 DISPLAY	294 TYPECHAR	302 CURRUBOUT	309 CURSOROFF
FUNCT:	VIBRATORUNITS	FILE=ORCA1.CC		
USERS:	1613 MOVETOLOCATIONSCREEN	2637 INITZYMATE		
CALLS:	144 IABS	148 IABS		
FUNCT:	WRISTCALIBRATIONSCREEN	FILE=ORCA1.CC		
USERS:	2118 ZYMATEHANDPROGRAMMING			
CALLS:	1067 CLEARFUNCTIONAREA	1068 DISPLAY	1069 DISPLAY	1070 DISPLAY
	1075 STROBECHAR	1083 DOCLAL	1084 DISPLAY	1084 LAST
	1086 DISPLAY	1086 LAST	1087 DOCLAL	1088 DISPLAY
	1095 CLEARFUNCTIONAREA	1097 DISPLAY	1098 DISPLAY	1099 DISPLAY
	1108 CLEARFUNCTIONAREA	1109 DISPLAY	1110 DISPLAY	1111 FDISPLAY
	1113 FDISPLAY	1114 FDISPLAY	1115 FDISPLAY	1116 FDISPLAY
	1118 COMMUNICATEWITHROBOT	1121 SETUPROBOTMESSAGE	1122 COMMUNICATEWITHROBOT	1124 DISPLAY
	1126 FDISPLAY	1127 FDISPLAY	1128 FDISPLAY	1129 FDISPLAY
	1135 SETFACTORYCAL	1136 SAVECALIBRATIONDATA	1146 SAVECALIBRATIONDATA	1147 DISPLAY
	1150 TELLPOSITION			
FUNCT:	ZYMATEHANDPROGRAMMING	FILE=ORCA1.CC		
USERS:	2240 ZYMATEPROGRAMMING			
CALLS:	2057 DISPLAY	2058 CLEARKEYBOXES	2059 DISPLAYHANDFUNCTIONKEYS	2060 CLEARFUNCTIONAREA
	2066 LAST	2071 HANDFKEYS	2072 SIZE	2072 FINDB
	2075 LAST	2076 LOADDATAWRIST	2080 HANDCOORDINATESSCREEN	2081 CLEARFUNCTIONAREA
	2083 DISPLAY	2083 LAST	2086 HANDSPEEDSCREEN	2087 CLEARFUNCTIONAREA
	2089 LAST	2089 DISPLAY	2092 HANDSENSESCREEN	2093 CLEARFUNCTIONAREA
	2095 LAST	2095 DISPLAY	2098 HANDDEFINITIONSCREEN	2102 STOREROBOTPOSITION
	2108 MOVETOCOORDINATESSCREEN	2111 CHANGELOCATIONSCREEN	2114 DELETECOMMANDSCREEN	2118 WRISTCALIBRATIONSCREEN
	2128 TYPEN	2132 STROBECHAR	2132 FORCEUPPER	2138 LAST
	2139 CLEARFUNCTIONAREA	2140 HANDFUNCTIONSCREEN	2142 RECEIVEMESSAGETIMEDWAIT	
FUNCT:	ZYMATEHANDWAIT	FILE=ORCA3.CC		

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Undefined (External) Functions, Function XREF (of USERS) (2 of 2) *****

FILE=	ASCIITOREAL	FILE=	1497 MOVETOLOCATIONSSCREEN	1875 GETSCALEDNR1
USERS:	788 DOCAL			
FUNCT: ATAN		FILE=	1133 RACKSETUPSCREEN	1170 RACKSETUPSCREEN 1211 RACKSETUPSCREEN
USERS: 942 MOVETORACKINDEX				
FUNCT: CHANGEEXPSYMBOL		FILE=	705 MONUMENTSCREEN	1260 RACKSETUPSCREEN 1382 HANDDEFINITIONSCREEN
USERS: 654 MONUMENTSCREEN				
FUNCT: CLEARSCREEN		FILE=	2152 ZYMATEPROGRAMMING	2451 INITZYMATE
USERS: 172 SENDMESSAGE TILLGOODSTATUS				
FUNCT: COS		FILE=	1134 RACKSETUPSCREEN	1173 RACKSETUPSCREEN 1213 RACKSETUPSCREEN
USERS: 944 MOVETORACKINDEX				
FUNCT: CREATEEXCHANGE		FILE=	1345 INITZYMATEROBOT	2370 INITZYMATE
USERS: 1340 INITZYMATEROBOT				
FUNCT: CREATETASK		FILE=		
USERS: 1363 INITZYMATEROBOT				
FUNCT: CURRENTCS		FILE=		
USERS: 1358 INITZYMATEROBOT				
FUNCT: CURRUBOUT		FILE=		
USERS: 302 VALUEENTERED				
FUNCT: CURSOROFF		FILE=	309 VALUEENTERED	
USERS: 276 VALUEENTERED				
FUNCT: CURSORON		FILE=		
USERS: 267 VALUEENTERED				
F	DDIV	FILE=	120 GETPOSITION	129 GETPOSITION 139 GETPOSITION
USERS:	111 GETPOSITION		478 CALCULATEBASEAXISCOUNTS	479 CALCULATEBASEAXISCOUNTS 480 CALCULATEBASEAXISCOUNTS
	173 GETPOSITION		762 CALCULATEHANDAXISCOUNTS	763 CALCULATEHANDAXISCOUNTS 804 DOCAL
	759 CALCULATEHANDAXISCOUNTS			
FUNCT: DELETEEXPSYMBOL		FILE=	2036 DELETECOMMANDSCREEN	
USERS: 571 MONUMENTSCREEN				
FUNCT: DISPLAY		FILE=		
USERS:	206 CLEARKEYBOXES		207 CLEARKEYBOXES	211 DISPLAYCOLLISIONMESSAGE 216 CLEARFUNCTIONAREA
	228 CLEARNAMEAREA		268 VALUEENTERED	283 VALUEENTERED 289 VALUEENTERED
	337 DISPLAYMAINSCEEN		338 DISPLAYMAINSCEEN	339 DISPLAYMAINSCEEN 340 DISPLAYMAINSCEEN
	342 STOPANDREINITROBOT		342 DISPLAYMAINSCEEN	343 DISPLAYMAINSCEEN 344 DISPLAYMAINSCEEN
	346 DISPLAYMAINSCEEN		347 DISPLAYMAINSCEEN	348 DISPLAYMAINSCEEN 349 DISPLAYMAINSCEEN
	354 DISPLAYMAINSCEEN		356 DISPLAYMAINSCEEN	362 DISPLAYBASEFUNCTIONKEYS 363 DISPLAYBASEFUNCTIONKEYS
	365 DISPLAYBASEFUNCTIONKEYS		366 DISPLAYBASEFUNCTIONKEYS	367 DISPLAYBASEFUNCTIONKEYS 368 DISPLAYBASEFUNCTIONKEYS
	370 DISPLAYBASEFUNCTIONKEYS		371 DISPLAYBASEFUNCTIONKEYS	377 DISPLAYHANDFUNCTIONKEYS 378 DISPLAYHANDFUNCTIONKEYS
	380 DISPLAYHANDFUNCTIONKEYS		381 DISPLAYHANDFUNCTIONKEYS	382 DISPLAYHANDFUNCTIONKEYS 383 DISPLAYHANDFUNCTIONKEYS
	385 DISPLAYHANDFUNCTIONKEYS		389 STOPANDREINITROBOT	392 BASEFUNCTIONSCREEN 393 BASEFUNCTIONSCREEN
	395 BASEFUNCTIONSCREEN		396 BASEFUNCTIONSCREEN	397 BASEFUNCTIONSCREEN 398 BASEFUNCTIONSCREEN
	400 BASEFUNCTIONSCREEN		401 BASEFUNCTIONSCREEN	402 BASEFUNCTIONSCREEN 403 BASEFUNCTIONSCREEN
	411 HANDFUNCTIONSCREEN		412 HANDFUNCTIONSCREEN	413 HANDFUNCTIONSCREEN 414 HANDFUNCTIONSCREEN
	416 HANDFUNCTIONSCREEN		417 HANDFUNCTIONSCREEN	418 HANDFUNCTIONSCREEN 419 HANDFUNCTIONSCREEN
	429 BASECOORDINATESCREEN		430 BASECOORDINATESCREEN	431 BASECOORDINATESCREEN 432 BASECOORDINATESCREEN
	468 BASESPEEDSCREEN		469 BASESPEEDSCREEN	470 BASESPEEDSCREEN 471 BASESPEEDSCREEN
	509 BASESENSESCREEN		510 BASESENSESCREEN	511 BASESENSESCREEN 512 BASESENSESCREEN
	514 BASESENSESCREEN		515 BASESENSESCREEN	554 MONUMENTSCREEN 555 MONUMENTSCREEN
	587 MONUMENTSCREEN		589 MONUMENTSCREEN	600 UPDTELASTNAME 601 UPDTELASTNAME
	603 UPDTELASTNAME		604 MONUMENTSCREEN	620 DISPLAYCURRENTGRIPFORCE 624 DISPLAYCURRENTGRIPFORCE
	637 DISPLAYBASEFORCES		641 DISPLAYBASEFORCES	643 MONUMENTSCREEN 648 DISPLAYBASEFORCES
	659 MONUMENTSCREEN		659 DISPLAYBASEFORCES	663 DISPLAYBASEFORCES 677 STOREANDCHECKSYMBOL
	687 STOREANDCHECKSYMBOL		688 MONUMENTSCREEN	701 STORECOMMANDVARIABLE 708 MONUMENTSCREEN
	715 MONUMENTSCREEN		722 STOREIMMEDIATECOMMAND	726 PROGRAMMINGCOMMANDSCREEN 727 PROGRAMMINGCOMMANDSCREEN
	729 PROGRAMMINGCOMMANDSCREEN		730 PROGRAMMINGCOMMANDSCREEN	731 PROGRAMMINGCOMMANDSCREEN 754 STOREROBOTPOSITION
	767 STOREROBOTPOSITION		813 DOCAL	820 DOCAL 883 DISPLAYCURRENTHAND
	964 CALIBRATIONSCREEN		965 CALIBRATIONSCREEN	966 CALIBRATIONSCREEN 967 CALIBRATIONSCREEN
	980 CALIBRATIONSCREEN		982 CALIBRATIONSCREEN	983 TELLPOSITION 993 TELLPOSITION
	995 CALIBRATIONSCREEN		996 CALIBRATIONSCREEN	997 TELLPOSITION 999 RACKSETUPSCREEN
	1007 TELLPOSITION		1007 CALIBRATIONSCREEN	1011 TELLPOSITION 1016 RACKSETUPSCREEN
	1021 TELLPOSITION		1027 TELLPOSITION	1030 TELLPOSITION 1034 TELLPOSITION
	1037 TELLPOSITION		1039 RACKSETUPSCREEN	1044 CALIBRATIONSCREEN 1047 RACKSETUPSCREEN
	1051 TELLPOSITION		1056 RACKSETUPSCREEN	1061 TELLPOSITION 1063 RACKSETUPSCREEN

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USFRS: 184 LOADDATAWRISTWAIT
 2946 INITZYMATE
 C : 774 SETUPROBOTMESSAGE
 793 REDOPOSITIONCONTROL

834 MOVEHAND
 776 COMMUNICATEWITHROBOT
 800 STOPANDREINITROBOT

1401 INITZYMATEROBOT

1605 MOVETOLOCATIONSCREEN

785 TYPEN

786 TYPECRLF

FUNCT: ZYMATEPROGRAMMING

FILE=ORCA1.CC

USERS: 2501 INITZYMATE
 CALLS: 2152 CLEARSCREEN
 2161 LAST
 2170 DISPLAY
 2180 LAST
 2186 LAST
 2196 CLEARFUNCTIONAREA
 2204 MOVETOCOORDINATESSCREEN
 2219 CLEARFUNCTIONAREA
 2228 CALIBRATIONSCREEN
 2243 DISPLAYBASEFUNCTIONKEYS
 2256 STROBECHAR
 2264 LAST

2153 DISPLAYMAINSSCREEN
 2166 BASEFKEYS
 2171 LOADDATABASE
 2180 DISPLAY
 2186 DISPLAY
 2197 BASEFUNCTIONSCREEN
 2207 CHANGELOCATIONSCREEN
 2220 BASEFUNCTIONSCREEN
 2232 RESTOREPOSITION
 2244 CLEARFUNCTIONAREA
 2256 FORCEUPPER
 2266 RECEIVEMESSAGETIMEDWAIT

2154 DISPLAYBASEFUNCTIONKEYS
 2167 SIZE
 2177 BASECOORDINATESCREEN
 2183 BASESPEEDSCREEN
 2189 STOREROBOTPOSITION
 2198 DISPLAY
 2210 RACKSETUPSCREEN
 2221 DISPLAY
 2240 ZYMATEHANDPROGRAMMING
 2245 BASEFUNCTIONSCREEN
 2262 CLEARFUNCTIONAREA

2155 BASEFUNCTIONSCREEN
 2167 FINDB
 2178 CLEARFUNCTIONAREA
 2184 CLEARFUNCTIONAREA
 2192 STOREROBOTPOSITION
 2198 LAST
 2214 MONUMENTSCREEN
 2221 LAST
 2241 DISPLAY
 2251 DISPLAY
 2263 BASEFUNCTIONSCREEN

FUNCT: ZYMATEWAIT

FILE=ORCA3.CC

USERS: 172 LOADDATABASEWAIT
 2920 INITZYMATE
 CALLS: 350 SETUPROBOTMESSAGE
 387 TYPEN
 409 TYPECRLF

674 MOVEZYMATE
 2929 INITZYMATE
 354 SETUPROBOTMESSAGE
 391 SHR
 412 RECEIVEMESSAGETIMEDWAIT

1400 INITZYMATEROBOT

2776 INITZYMATE

358 SETUPROBOTMESSAGE
 393 TYPEN
 413 COMMUNICATEWITHROBOT

362 COMMUNICATEWITHROBOT
 399 TYPEN
 416 REDOPOSITIONCONTROL

1068 RACKSETUPSCREEN	1068 WRISTCALIBRATIONSCREEN	1069 WRISTCALIBRATIONSCREEN	1070 WRISTCALIBRATIONSCREEN
1082 RACKSETUPSCREEN	1084 WRISTCALIBRATIONSCREEN	1086 WRISTCALIBRATIONSCREEN	1088 DISPLAYNUMBER
1089 RACKSETUPSCREEN	1097 WRISTCALIBRATIONSCREEN	1098 WRISTCALIBRATIONSCREEN	1099 WRISTCALIBRATIONSCREEN
1110 WRISTCALIBRATIONSCREEN	1114 RACKSETUPSCREEN	1124 WRISTCALIBRATIONSCREEN	1124 RACKSETUPSCREEN
1137 RACKSETUPSCREEN	1147 WRISTCALIBRATIONSCREEN	1159 HANDCOORDINATESCREEN	1160 HANDCOORDINATESCREEN
1161 HANDCOORDINATESCREEN	1162 HANDCOORDINATESCREEN	1162 RACKSETUPSCREEN	1176 RACKSETUPSCREEN
1198 HANDSPEEDSCREEN	1199 HANDSPEEDSCREEN	1200 HANDSPEEDSCREEN	1201 HANDSPEEDSCREEN
1203 RACKSETUPSCREEN	1239 HANDSENSESCREEN	1240 HANDSENSESCREEN	1240 RACKSETUPSCREEN
1242 HANDSENSESCREEN	1243 HANDSENSESCREEN	1265 RACKSETUPSCREEN	1269 RACKSETUPSCREEN
1299 HANDDEFINITIONSCREEN	1309 HANDDEFINITIONSCREEN	1310 HANDDEFINITIONSCREEN	1325 HANDDEFINITIONSCREEN
1350 HANDDEFINITIONSCREEN	1351 HANDDEFINITIONSCREEN	1352 HANDDEFINITIONSCREEN	1388 HANDDEFINITIONSCREEN
1398 HANDDEFINITIONSCREEN	1409 INPUTANDMOVETORACKINDEX	1465 MOVETOLOCATIONSCREEN	1466 MOVETOLOCATIONSCREEN
1494 MOVETOLOCATIONSCREEN	1535 MOVETOLOCATIONSCREEN	1541 MOVETOLOCATIONSCREEN	1547 MOVETOLOCATIONSCREEN
1711 MOVETOLOCATIONSCREEN	1767 MOVETOLOCATIONSCREEN	1774 MOVETOLOCATIONSCREEN	1785 MOVETOLOCATIONSCREEN
1791 MOVETOLOCATIONSCREEN	1794 MOVETOLOCATIONSCREEN	1797 MOVETOLOCATIONSCREEN	1800 MOVETOLOCATIONSCREEN
1812 MOVETOLOCATIONSCREEN	1815 MOVETOLOCATIONSCREEN	1845 MOVETOLOCATIONSCREEN	1851 MOVETOLOCATIONSCREEN
1974 CHANGELOCATIONSCREEN	1980 CHANGELOCATIONSCREEN	1984 CHANGELOCATIONSCREEN	1988 CHANGELOCATIONSCREEN
2001 CHANGELOCATIONSCREEN	2007 CHANGELOCATIONSCREEN	2017 DELETecomMANDSCREEN	2018 DELETecomMANDSCREEN
2032 DELETecomMANDSCREEN	2039 DELETecomMANDSCREEN	2043 DELETecomMANDSCREEN	2057 ZYMATEHANDPROGRAMMING
2083 ZYMATEHANDPROGRAMMING	2089 ZYMATEHANDPROGRAMMING	2095 ZYMATEHANDPROGRAMMING	2127 ZYMATEHANDPROGRAMMING
2170 ZYMATEPROGRAMMING	2180 ZYMATEPROGRAMMING	2186 ZYMATEPROGRAMMING	2198 ZYMATEPROGRAMMING
2241 ZYMATEPROGRAMMING	2251 ZYMATEPROGRAMMING	2264 ZYMATEPROGRAMMING	

FUNCT: DMUL	FILE#		
USERS: 111 GETPOSITION	120 GETPOSITION	129 GETPOSITION	139 GETPOSITION
173 GETPOSITION	478 CALCULATEBASEAXISCOUNTS	479 CALCULATEBASEAXISCOUNTS	480 CALCULATEBASEAXISCOUNTS
759 CALCULATEHANDAXISCOUNTS	762 CALCULATEHANDAXISCOUNTS	763 CALCULATEHANDAXISCOUNTS	804 DOCAL

FUNCT: DOUBLE	FILE#		
USERS: 111 GETPOSITION	111 GETPOSITION	120 GETPOSITION	120 GETPOSITION
139 GETPOSITION	139 GETPOSITION	143 GETPOSITION	143 GETPOSITION
152 GETPOSITION	173 GETPOSITION	173 GETPOSITION	174 SENDMESSAGEILLGOODSTATUS
478 CALCULATEBASEAXISCOUNTS	479 CALCULATEBASEAXISCOUNTS	479 CALCULATEBASEAXISCOUNTS	480 CALCULATEBASEAXISCOUNTS
755 CALCULATEHANDAXISCOUNTS	755 CALCULATEHANDAXISCOUNTS	759 CALCULATEHANDAXISCOUNTS	759 CALCULATEHANDAXISCOUNTS
762 CALCULATEHANDAXISCOUNTS	763 CALCULATEHANDAXISCOUNTS	763 CALCULATEHANDAXISCOUNTS	804 DOCAL
804 DOCAL			

FUNCT: FDISPLAY	FILE#		
USERS: 173 SENDMESSAGEILLGOODSTATUS	175 SENDMESSAGEILLGOODSTATUS	588 MONUMENTSCREEN	604 UPDATALASTNAME
999 TELLPOSITION	1008 CALIBRATIONSCREEN	1009 CALIBRATIONSCREEN	1010 CALIBRATIONSCREEN
1012 CALIBRATIONSCREEN	1013 CALIBRATIONSCREEN	1013 TELLPOSITION	1022 CALIBRATIONSCREEN
1024 CALIBRATIONSCREEN	1025 CALIBRATIONSCREEN	1026 CALIBRATIONSCREEN	1027 CALIBRATIONSCREEN
1036 TELLPOSITION	1053 TELLPOSITION	1067 TELLPOSITION	1098 RACKSETUPSCREEN
1112 WRISTCALIBRATIONSCREEN	1113 WRISTCALIBRATIONSCREEN	1114 WRISTCALIBRATIONSCREEN	1115 WRISTCALIBRATIONSCREEN
1125 WRISTCALIBRATIONSCREEN	1126 WRISTCALIBRATIONSCREEN	1127 WRISTCALIBRATIONSCREEN	1128 WRISTCALIBRATIONSCREEN
1130 WRISTCALIBRATIONSCREEN	1141 RACKSETUPSCREEN	1161 RACKSETUPSCREEN	1180 RACKSETUPSCREEN
1841 MOVETOLOCATIONSCREEN			

FUNCT: FINDB	FILE#		
USERS: 441 BASECOORDINATESCREEN	480 BASESPEEDSCREEN	524 BASESENSESCREEN	740 PROGRAMMINGCOMMANDSCREEN
1252 HANDSENSESCREEN	2072 ZYMATEHANDPROGRAMMING	2167 ZYMATEPROGRAMMING	

FUNCT: FINDSYMBOL	FILE#
USERS: 567 MONUMENTSCREEN	1479 MOVETOLOCATIONSCREEN

FUNCT: FINPUT	FILE#		
USERS: 644 MONUMENTSCREEN	702 STORECOMMANDVARIABLE	723 STOREIMMEDIATECOMMAND	742 STOREROBOTPOSITION
1067 RACKSETUPSCREEN	1146 RACKSETUPSCREEN	1185 RACKSETUPSCREEN	1311 HANDDEFINITIONSCREEN
1467 MOVETOLOCATIONSCREEN	1674 MOVETOLOCATIONSCREEN	1963 CHANGELOCATIONSCREEN	2019 DELETecomMANDSCREEN

FUNCT: FIX	FILE#		
USERS: 801 DOCAL	910 MOVETORACKINDEX	937 MOVETORACKINDEX	944 MOVETORACKINDEX
964 MOVETORACKINDEX	983 MOVETORACKINDEX	1296 COMPUTERACKLOCATION	1370 HANDDEFINITIONSCREEN
1436 GETSCALEDATA	1611 MOVETOLOCATIONSCREEN	1629 MOVETOLOCATIONSCREEN	1638 MOVETOLOCATIONSCREEN
1650 MOVETOLOCATIONSCREEN	1656 MOVETOLOCATIONSCREEN	1662 MOVETOLOCATIONSCREEN	1668 MOVETOLOCATIONSCREEN
2301 RANGECHECKEDSPEEDIN	2551 INITZYMATE	2564 INITZYMATE	2577 INITZYMATE
2635 INITZYMATE	2657 INITZYMATE	2873 INITZYMATE	2886 INITZYMATE

FUNCT: FLOAT	FILE#		
USERS: 933 MOVETORACKINDEX	933 MOVETORACKINDEX	934 MOVETORACKINDEX	934 MOVETORACKINDEX
943 MOVETORACKINDEX	1131 RACKSETUPSCREEN	1132 RACKSETUPSCREEN	1133 RACKSETUPSCREEN
1136 RACKSETUPSCREEN	1168 RACKSETUPSCREEN	1169 RACKSETUPSCREEN	1170 RACKSETUPSCREEN
1171 RACKSETUPSCREEN	1175 RACKSETUPSCREEN	1209 RACKSETUPSCREEN	1210 RACKSETUPSCREEN
1211 RACKSETUPSCREEN	1212 RACKSETUPSCREEN	1213 RACKSETUPSCREEN	1214 RACKSETUPSCREEN
1215 RACKSETUPSCREEN	1246 RACKSETUPSCREEN	1370 HANDDEFINITIONSCREEN	1370 HANDDEFINITIONSCREEN
1372 HANDDEFINITIONSCREEN	1628 MOVETOLOCATIONSCREEN	1628 MOVETOLOCATIONSCREEN	1637 MOVETOLOCATIONSCREEN
1643 MOVETOLOCATIONSCREEN	1643 MOVETOLOCATIONSCREEN	1649 MOVETOLOCATIONSCREEN	1649 MOVETOLOCATIONSCREEN
1655 MOVETOLOCATIONSCREEN	1661 MOVETOLOCATIONSCREEN	1661 MOVETOLOCATIONSCREEN	1667 MOVETOLOCATIONSCREEN

1876 GETSCALEDNR1	1878 GETSCALEDNR1	1882 GETSCALEDNR1	1884 GETSCALEDNR1
2291 RANGECHECKEDSPEEDIN	2295 RANGECHECKEDSPEEDIN	2297 RANGECHECKEDSPEEDIN	2555 INITZYMATE
2581 INITZYMATE	2620 INITZYMATE	2642 INITZYMATE	2666 INITZYMATE
2693 INITZYMATE	2705 INITZYMATE	2717 INITZYMATE	2729 INITZYMATE
2753 INITZYMATE	2779 INITZYMATE	2785 INITZYMATE	2791 INITZYMATE
2892 INITZYMATE	2905 INITZYMATE		

FUNCT: FREERAM	FILE=		
USERS: 1275 RACKSETUPSCREEN	1309 COMPUTERACKLOCATION	1364 INITZYMATEROBOT	2394 INITZYMATE

FUNCT: GETCHAR	FILE=		
USERS: 272 VALUEENTERED	593 MONUMENTSCREEN	608 MONUMENTSCREEN	1017 RACKSETUPSCREEN

FUNCT: GETRAM	FILE=		
USERS: 995 RACKSETUPSCREEN	1290 COMPUTERACKLOCATION	1338 INITZYMATEROBOT	1355 INITZYMATEROBOT
2497 INITZYMATE	2794 INITZYMATE		

FUNCT: HIGH	FILE=		
USERS: 284 DOPOSITIONCONTROL	286 DOPOSITIONCONTROL	288 DOPOSITIONCONTROL	313 REDOPOSITIONCONTROL
321 REDOPOSITIONCONTROL	323 REDOPOSITIONCONTROL	325 REDOPOSITIONCONTROL	561 MONUMENTSCREEN
2366 INITZYMATE			

FUNCT: IABS	FILE=		
USERS: 144 VIBRATORUNITS	148 VIBRATORUNITS	576 MOVEZYMATE	577 MOVEZYMATE
644 DISPLAYBASEFORCES	655 DISPLAYBASEFORCES	666 DISPLAYBASEFORCES	759 CALCULATEHANDAXISCOUNTS

FUNCT: INPUT	FILE=		
USERS: 421 BASEFKEYS	498 BASEFKEYS	522 HANDFKEYS	584 HANDFKEYS
915 DOWRISTZEROS	952 DOWRISTZEROS		

FUNCT: KEYBOXES	FILE=		
USERS: 351 DISPLAYMAINSCEEN			

FUNCT: LAST	FILE=		
USERS: 206 CLEARKEYBOXES	207 CLEARKEYBOXES	216 CLEARFUNCTIONAREA	220 CLEARFUNCTIONAREA
389 STOPANDREINITROBOT	435 BASECOORDINATESCREEN	474 BASESPEEDSCREEN	518 BASESENSESCREEN
600 UPDTELASTNAME	601 UPDTELASTNAME	602 UPDTELASTNAME	603 UPDTELASTNAME
701 STORECOMMANDVARIABLE	708 MONUMENTSCREEN	722 STOREIMMEDIATECOMMAND	734 PROGRAMMINGCOMMANDSCREEN
982 CALIBRATIONSCREEN	1035 RACKSETUPSCREEN	1068 RACKSETUPSCREEN	1084 WRISTCALIBRATIONSCREEN
1088 WRISTCALIBRATIONSCREEN	1124 RACKSETUPSCREEN	1165 HANDCOORDINATESCREEN	1204 HANDSPEEDSCREEN
1350 HANDDEFINITIONSCREEN	1351 HANDDEFINITIONSCREEN	1373 INITZYMATEROBOT	1465 MOVETOLOCATIONSSCREEN
2066 ZYMATEHANDPROGRAMMING	2075 ZYMATEHANDPROGRAMMING	2083 ZYMATEHANDPROGRAMMING	2089 ZYMATEHANDPROGRAMMING
2138 ZYMATEHANDPROGRAMMING	2161 ZYMATEPROGRAMMING	2170 ZYMATEPROGRAMMING	2180 ZYMATEPROGRAMMING
2198 ZYMATEPROGRAMMING	2221 ZYMATEPROGRAMMING	2264 ZYMATEPROGRAMMING	

FUNCT: LOOKUPEXPSYMBOL	FILE=		
USERS: 563 MONUMENTSCREEN	672 MONUMENTSCREEN	1005 RACKSETUPSCREEN	1071 RACKSETUPSCREEN
1296 HANDDEFINITIONSCREEN	1318 HANDDEFINITIONSCREEN	1678 MOVETOLOCATIONSSCREEN	1968 CHANGELOCATIONSSCREEN
2799 INITZYMATE			

FUNCT: LOW	FILE=		
USERS: 111 GETPOSITION	120 GETPOSITION	129 GETPOSITION	139 GETPOSITION
173 GETPOSITION	283 DOPOSITIONCONTROL	285 DOPOSITIONCONTROL	287 DOPOSITIONCONTROL
314 REDOPOSITIONCONTROL	316 REDOPOSITIONCONTROL	320 REDOPOSITIONCONTROL	322 REDOPOSITIONCONTROL
478 CALCULATEBASEAXISCOUNTS	479 CALCULATEBASEAXISCOUNTS	480 CALCULATEBASEAXISCOUNTS	560 MONUMENTSCREEN
759 CALCULATEHANDAXISCOUNTS	762 CALCULATEHANDAXISCOUNTS	763 CALCULATEHANDAXISCOUNTS	804 DOCLAL
2365 INITZYMATE			

FUNCT: MOV8	FILE=		
USERS: 670 MONUMENTSCREEN	673 STOREANDCHECKSYMBOL	1078 RACKSETUPSCREEN	1291 COMPUTERACKLOCATION
1374 HANDDEFINITIONSCREEN	1474 MOVETOLOCATIONSSCREEN	1482 MOVETOLOCATIONSSCREEN	1677 MOVETOLOCATIONSSCREEN
1829 MOVETOLOCATIONSSCREEN	1834 MOVETOLOCATIONSSCREEN	2372 INITZYMATE	2386 INITZYMATE
2865 INITZYMATE			

FUNCT: MOVW	FILE=		
USERS: 785 GETCALIBRATIONDATA	789 GETCALIBRATIONDATA	817 SAVECALIBRATIONDATA	820 SAVECALIBRATIONDATA

FUNCT: NUMOUT	FILE=		
USERS: 1835 MOVETOLOCATIONSSCREEN			

FUNCT: REALTOASCII	FILE=		
S: 1830 MOVETOLOCATIONSSCREEN			

FUNCT: RECEIVEMESSAGE	FILE=		
USERS: 161 SENDMESSAGEILLGOODSTATUS	1436 STOPPROGRAM	1446 STOPPROGRAM	2419 INITZYMATE

FUNCT: RECEIVEMESSEGETIMEDWAIT	FILE=		
USERS: 412 ZYMATEWAIT	497 BASEFKEYS	583 HANDFKEYS	789 ZYMATEHANDWAIT

1440 STOPPROGRAM 2783 INITZYMATE	2142 ZYMATEHANDPROGRAMMING 2789 INITZYMATE	2266 ZYMATEPROGRAMMING	2618 INITZYMATE
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: RELEASE FILE*
 : 179 SENDMESSAGEILLGOODSTATUS 359 STOPANDREINITROBOT

FUNCT: SAL FILE=
 USERS: 294 COMPUTEABSOLUTE 295 COMPUTEABSOLUTE 296 COMPUTEABSOLUTE 302 COMPUTERELATIVE
 310 COMPUTEHAND 311 COMPUTEHAND 312 COMPUTEHAND 893 GETDICTIONARYHANDOFFSETS
 895 GETDICTIONARYHANDOFFSETS 1303 HANDDEFINITIONSCREEN 1304 HANDDEFINITIONSCREEN 1305 HANDDEFINITIONSCREEN
 1685 MOVETOLOCATIONSCREEN 1686 MOVETOLOCATIONSCREEN 2804 INITZYMATE 2805 INITZYMATE

FUNCT: SAR FILE=
 USERS: 268 SETABSOLUTE 270 SETABSOLUTE 272 SETABSOLUTE 278 SETRELATIVE
 286 SETHAND 287 SETHAND 288 SETHAND 984 TELLPOSITION
 1012 TELLPOSITION 1028 TELLPOSITION 1035 TELLPOSITION 1052 TELLPOSITION

FUNCT: SENDMESSAGE FILE=
 USERS: 160 SENDMESSAGEILLGOODSTATUS 256 STOPMONITOR 1445 STOPPROGRAM 2342 RETURNTOEXEC

FUNCT: SHR FILE=
 USERS: 221 DISPLAYCOLLISIONMESSAGE 227 DISPLAYCOLLISIONMESSAGE 245 DISPLAYCOLLISIONMESSAGE 251 DISPLAYCOLLISIONMESSAGE
 2430 INITZYMATE

FUNCT: SIGNED FILE=
 USERS: 111 GETPOSITION 120 GETPOSITION 129 GETPOSITION 139 GETPOSITION
 173 GETPOSITION 805 DOCAL 805 DOCAL 805 DOCAL
 808 DOCAL 891 TOINTEGER 895 TOINTEGER 933 MOVETORACKINDEX
 934 MOVETORACKINDEX 934 MOVETORACKINDEX 935 MOVETORACKINDEX 935 MOVETORACKINDEX
 1212 RACKSETUPSCREEN 1213 RACKSETUPSCREEN 1214 RACKSETUPSCREEN 1215 RACKSETUPSCREEN
 2291 RANGECHECKEDSPEEDIN 2295 RANGECHECKEDSPEEDIN 2297 RANGECHECKEDSPEEDIN 2681 INITZYMATE
 2705 INITZYMATE 2717 INITZYMATE 2729 INITZYMATE 2741 INITZYMATE

FUNCT: SIN FILE=
 USERS: 1135 RACKSETUPSCREEN 1174 RACKSETUPSCREEN 1214 RACKSETUPSCREEN 1372 HANDDEFINITIONSCREEN

: SIZE FILE=
 : 146 SETUPROBOTMESSAGE 441 BASECOORDINATESCREEN 480 BASESPEEDSCREEN 524 BASESENSESCREEN
 676 MONUMENTSCREEN 705 STORECOMMANDVARIABLE 726 STOREIMMEDIATECOMMAND 740 PROGRAMMINGCOMMANDSCREEN
 745 STOREROBOTPOSITION 1171 HANDCOORDINATESCREEN 1210 HANDSPEEDSCREEN 1248 RACKSETUPSCREEN
 1252 HANDSENSESCREEN 1338 INITZYMATEROBOT 1351 INITZYMATEROBOT 1375 HANDDEFINITIONSCREEN
 1412 STOPPROGRAM 1429 STOPPROGRAM 2072 ZYMATEHANDPROGRAMMING 2167 ZYMATEPROGRAMMING
 2383 INITZYMATE

FUNCT: SQRT FILE=
 USERS: 941 MOVETORACKINDEX 1132 RACKSETUPSCREEN 1169 RACKSETUPSCREEN 1210 RACKSETUPSCREEN

FUNCT: STOREEXPSYMBOL FILE=
 USERS: 650 MONUMENTSCREEN 674 STOREANDCHECKSYMBOL 701 MONUMENTSCREEN 1256 RACKSETUPSCREEN

FUNCT: STROBECHAR FILE=
 USERS: 412 BASEFKEYS 513 HANDFKEYS 776 DOCAL 839 DOBASEZEROS
 1075 WRISTCALIBRATIONSCREEN 2132 ZYMATEHANDPROGRAMMING 2256 ZYMATEPROGRAMMING 2476 INITZYMATE

FUNCT: STROBEKEYPAD FILE=
 USERS: 383 STOPANDREINITROBOT 386 STOPANDREINITROBOT

FUNCT: TIME FILE=
 USERS: 118 RESETMESSAGEAREAANDUART 122 RESETMESSAGEAREAANDUART 125 RESETMESSAGEAREAANDUART 127 RESETMESSAGEAREAANDUART
 134 RESETMESSAGEAREAANDUART

FUNCT: TYPECHAR FILE=
 USERS: 294 VALUEENTERED 602 MONUMENTSCREEN 631 MONUMENTSCREEN

FUNCT: TYPECLRF FILE=
 USERS: 355 STOPANDREINITROBOT 409 ZYMATEWAIT 786 ZYMATEHANDWAIT 920 MOVETORACKINDEX
 2392 INITZYMATE 2471 INITZYMATE 2487 INITZYMATE 2521 INITZYMATE
 2837 INITZYMATE

FUNCT: TYPM FILE=
 USERS: 217 DISPLAYCOLLISIONMESSAGE 223 DISPLAYCOLLISIONMESSAGE 229 DISPLAYCOLLISIONMESSAGE 235 DISPLAYCOLLISIONMESSAGE
 253 DISPLAYCOLLISIONMESSAGE 259 DISPLAYCOLLISIONMESSAGE 287 VALUEENTERED 338 STOPANDREINITROBOT
 381 ZYMATEWAIT 387 ZYMATEWAIT 393 ZYMATEWAIT 399 ZYMATEWAIT
 785 ZYMATEHANDWAIT 919 MOVETORACKINDEX 1303 COMPUTERACKLOCATION 1996 CHANGELOCATIONSCREEN
 2128 ZYMATEHANDPROGRAMMING 2252 ZYMATEPROGRAMMING 2376 INITZYMATE 2391 INITZYMATE
 2457 INITZYMATE 2461 INITZYMATE 2465 INITZYMATE 2469 INITZYMATE
 2520 INITZYMATE 2827 INITZYMATE 2836 INITZYMATE

FUNCT: TYPES

FILE=

USERS: 1302 COMPUTERACKLOCATION

FUNCT: UNSIGN

FILE=

478 CALCULATEBASEAXISCOUNTS	479 CALCULATEBASEAXISCOUNTS	480 CALCULATEBASEAXISCOUNTS	576 MOVEZYMAE
627 DISPLAYCURRENTGRIPFORCE	644 DISPLAYBASEFORCES	655 DISPLAYBASEFORCES	666 DISPLAYBASEFORCES
759 CALCULATEHANDAXISCOUNTS	762 CALCULATEHANDAXISCOUNTS	763 CALCULATEHANDAXISCOUNTS	801 DOCAL
805 DOCAL	805 DOCAL	984 TELLPOSITION	998 TELLPOSITION
1028 TELLPOSITION	1035 TELLPOSITION	1052 TELLPOSITION	1066 TELLPOSITION
1629 MOVETOLOCATIONSSCREEN	1638 MOVETOLOCATIONSSCREEN	1644 MOVETOLOCATIONSSCREEN	1650 MOVETOLOCATIONSSCREEN
1662 MOVETOLOCATIONSSCREEN	1668 MOVETOLOCATIONSSCREEN	2301 RANGECHECKEDSPEEDIN	

FUNCT: XLAT

FILE=

USERS: 2441 INITZYMAE

C-DOC
VARIABLE/CONSTANT XREF

Local/Param/Global Variables/Constants, Function XREF

	(null)	FILE=ORCA1.CC							
DEFIN:	BYTEDATA	56 : 38	56						
	COMMAND	70 : 26	70						
	COMMANDENTRY	46 : 36	46						
	COMMANDMSG	69 : 69							
	COMMANDVARIABLE	41 : 41							
	HANDCOMMAND	27 : 27							
	HANDGEOMETRY	73 : 35	73						
	IMMEDIATECOMMAND	76 : 76							
	MAXTRIES	53 : 53							
	MODULE	45 : 45							
	MODULEDATA	86 : 86							
	MOVEWAIT	30 : 30							
	NORMALWAIT	29 : 29							
	PARM	81 : 81							
	RACKCOMMAND	30 : 30							
	RACKCOMMANDENTRY	29 : 29							
	RACKINDEX	46 : 46							
	REALDATA	58 : 40	58						
	RETURNDATA	72 : 72							
	TIMER0	25 : 25							
	TIMER1	26 : 26							
	TIMER2	27 : 27							
	TIMERCMD	28 : 28							
	UARTOFFSET	25 : 24	25						
	VARIABLECOMMAND	71 : 71							
	VARIABLEDATA	42 : 42							
	WORDDATA	57 : 39	57						
	WORKINGRAMSIZE	43 : 43							
	ZYMATEPLACE	44 : 44							
GLOBL:	..COMMAND	67 : 67							
	..COMMANDCODE	39 : 39							
	..DESTINATIONID	61 : 61							
	..EXCHANGEID	53 : 53							
	..EXCHANGELINK	58 : 58							
	..HOMEID	65 : 65							
	..LENGTH	63 : 63	78						
	..LINK	62 : 62							
	..MESSAGEHEAD	54 : 54							
	..MESSAGETAIL	55 : 55							
	..MODULEID	38 : 38							
	..PTR	79 : 79							
	..RESPONSEID	66 : 66							
	..TASKHEAD	56 : 56							
	..TASKTAIL	57 : 57							
	..TYPE	64 : 64							
	A	49 : 49							
	ACCESSPTR	0 : 38	39	40	56	57	58	86	
	AH	0 : 27							
	ANGLECOUNTS	31 : 31							
	ANGLEMESSAGE	35 : 35							
	AXISERROR	54 : 54							
	AXISFORCE	74 : 74							
	BASEAXIS1POS	46 : 46							
	BASEAXIS2POS	45 : 45							
	BASEAXIS3POS	44 : 44							
	BASEFORCEACTIVE	47 : 47							
	BH	0 : 28							
	BLINKSCLEARED	43 : 43							
	BUFFER	95 : 95							
	CAL	98 : 98							
	CALWARNING	41 : 41							
	CHECKSUM	51 : 51							
	COL	47 : 47							
	COMMANDCODE	90 : 90							
	COMMANDEXCHANGE	59 : 59							
	COMMANDMSGPTR	68 : 68	69						
	COMMANDPTR	0 : 26	27	70	71	72	76		
	COMMANDTABLE	93 : 93							
	COMMANDTYPE	89 : 89							
	CURRENTHANDHEIGHTOFFSET	34 : 34							
	CURRENTHANDLATERALOFFSET	32 : 32							
	CURRENTHANDREACHOFFSET	33 : 33							
	DUMMYCODE	62 : 62							

[illegible]

[illegible]

RELATIVESIGN	0 : 1984								
RESPONSE	0 : 1968	1970	1992	1994					
TYPE	0 : 1970								

FUNCT: CLEARFUNCTIONAREA	FILE=ORCA1.CC								
GLOBL: I	0 : 214	214	214	216	218	218	218	220	
SPACES	0 : 216	216	220	220					

FUNCT: CLEARKEYBOXES	FILE=ORCA1.CC								
GLOBL: I	0 : 204	204	204	204	206	207			
SPACES	0 : 206	206	207	207					

FUNCT: CLEARNAMEAREA	FILE=ORCA1.CC								
GLOBL: SPACES	0 : 227	227	228	228					

FUNCT: COMMUNICATEWITHROBOT	FILE=ORCA3.CC								
GLOBL: BYTESIN	0 : 242								
BYTESOUT	0 : 231	242	242	242					
CHECKSUM	0 : 242								
KEYPADSTATUS	0 : 236								
ROBOTMESSAGE	0 : 231	238	242	242	242	242	242		
ROBOTSTATUS	0 : 232	233	241	244					
TEXT	0 : 238	242							

FUNCT: COMPUTEABSOLUTE	FILE=ORCA2.CC								
DEFIN: COMMAND	0 : 294	295	296						
GLOBL: ANGLE	0 : 296								
HEIGHT	0 : 294								
PENDINGANGLE	0 : 296								
PENDINGHEIGHT	0 : 294								
PENDINGREACH	0 : 295								
REACH	0 : 295								
REFANGLE	0 : 296								
REFHEIGHT	0 : 294								
REFREACH	0 : 295								

FI : COMPUTECHECKSUM	FILE=ORCA3.CC								
: CHECKSUM	0 : 196	199	199	201	201	202			
: ROBOTMESSAGE	0 : 199	202							
: TEXT	0 : 199	202							
PARAM: INDEX	193 : 192	193	197	202					
LOCAL: I	195 : 195	197	197	197	199				

FUNCT: COMPUTEHAND	FILE=ORCA2.CC								
DEFIN: HANDCOMMAND	0 : 310	311	312						
GLOBL: GRIP	0 : 311								
PENDINGGRIP	0 : 311								
PENDINGSYRINGE	0 : 312								
PENDINGWRIST	0 : 310								
SYRINGE	0 : 312								
WRIST	0 : 310								

FUNCT: COMPUTERACKLOCATION	FILE=ORCA2.CC								
DEFIN: RACKCOMMAND	0 : 1284	1284	1284	1284	1284	1284	1284	1291	1291
RACKINDEX	0 : 1291	1292	1295	1295	1302				
REALDATA	0 : 1296								
GLOBL: ABORT	0 : 1305								
ACCESSPTR	0 : 1295								
COL	0 : 1284								
COMMANDMODE	0 : 1300								
COMMANDPTR	0 : 1281								
DXC	0 : 1284								
DXR	0 : 1284								
DYC	0 : 1284								
DYR	0 : 1284								
DZC	0 : 1284								
DZR	0 : 1284								
NAME	0 : 1295								
NAMELENGTH	0 : 1291	1295	1302						
NAMES	0 : 1291	1291							
RACKCOMMANDPTR	0 : 1281								
RACKINDEXPTR	0 : 1290	1309							
RESPONSE	0 : 1292	1293							

FUNCT: COMPUTERELATIVE	FILE=ORCA2.CC								
DEFIN: COMMAND	0 : 302	303	304						
GLOBL: ANGLE	0 : 304								
HEIGHT	0 : 302								

FUNCTION		DOCAL	FILE	ORCA1.CC								
GLOBL:	BUFFER		0 :	782	788							
	CAL		0 :	809								
	CALFACTOR		0 :	804	805	805	807					
	CALWARNING		0 :	813	820							
	CHAR		0 :	776								
	NUMBER		0 :	777	778	801	802	804	808	814		
	PENDINGVALUE		0 :	804	808							
	RN1		0 :	788	789	791	795	797	801			
PARAM:	AXISCALFACTORPTR		771 :	767	771							
	AXISPOSPTR		772 :	767	772							
	CAL10PERCENT		773 :	767	773	805	805					
	COL		769 :	767	769	780						
	FORMATPTR		770 :	767	770							

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C-DOC

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ROBOTMESSAGE      0 : 101
SYRINGE           0 : 148 152 155 157 161 163
TEMP              0 : 105 111 114 120 123 129 137 139 143 146 152 167 173
TEXT              0 : 101
WRIST             0 : 139 143
PARAM: PORTADDRESS 81 : 80 81 89 102
LOCAL: ..A         86 : 86
               ..B         85 : 85
               ..C         84 : 84
ROBOTCOMMANDCODE  88 : 88 91 95 98
TEMPPTR           87 : 87 101
-----
FUNCT: GETSCALEDATA      FILE=ORCA1.CC
GLOBL: RN1              0 : 1436
PARAM: SCALEFACTOR      1434 : 1433 1434 1436
-----
FUNCT: GETSCALEDNRN1     FILE=ORCA1.CC
GLOBL: BUFFER           0 : 1875
RN1                    0 : 1875 1876 1878 1882 1884 1888
PARAM: MAX              1872 : 1870 1872 1882 1884
MIN                    1871 : 1870 1871 1876 1878
SCALEFACTOR            1873 : 1870 1873 1875
-----
FUNCT: GETWRISTFORCEVALUES FILE=ORCA3.CC
GLOBL: GRIPFORCE        0 : 937
ROBOTMESSAGE           0 : 935 936 937 938
SYRINGEFORCE           0 : 936
TEXT                   0 : 935 936 937 938
WRISTFORCE             0 : 935
WRISTSTATUS            0 : 938
-----
FUNCT: HANDCOORDINATESCREEN FILE=ORCA1.CC
GLOBL: CHAR             0 : 1171
ZPCASE                 0 : 1164 1165 1167 1168 1171 1173
LOCAL: ZPKEYS           1156 : 1156 1165 1171 1171
-----
FUNCT: HANDDEFINITIONSSCREEN FILE=ORCA1.CC
GLOBL: COMMAND          0 : 1303 1304 1305
COMMANDENTRY           0 : 1280 1281 1282 1283 1284 1294 1294 1294 1295 1295 1302 1302 1311 1312 1321
HANDGEOMETRY           0 : 1323 1323 1365 1366 1369 1370 1371 1371 1372 1375
ABBREV                 0 : 1368
ANGLE                  0 : 1305 1370 1372
BASEPAGE               0 : 1343
CHAR                   0 : 1344 1356
COMMANDCODE            0 : 1323 1366
COMMANDPTR             0 : 1295 1302
CURRENTHANDNAME        0 : 1374
FORMAT                 0 : 1363
G                       0 : 1341 1352
HANDGEOMETRYPTR        0 : 1321 1364
HEIGHT                 0 : 1303 1369
HEIGHTOFFSET           0 : 1369
LATERALOFFSET          0 : 1372
LENGTH                0 : 1375
MODULEID               0 : 1323 1365
MONUMENTANGLE          0 : 1305 1370 1372
MONUMENTHEIGHT         0 : 1303 1369
MONUMENTREACH          0 : 1304 1370 1372
MYMODULEID             0 : 1282 1283 1323 1365
NAME                   0 : 1281 1282 1283 1284 1294 1294 1295 1302 1321 1364 1374 1374 1375
NAMELENGTH             0 : 1280 1294 1295 1302 1311 1312 1321 1364 1368 1374 1374 1375
RAMPTR                0 : 1285 1296 1318 1378 1382
REACH                  0 : 1304 1371
REACHOFFSET            0 : 1370 1371 1371
RESPONSE               0 : 1285 1286 1296 1297 1318 1319 1378 1382 1386
SPACES                 0 : 1350 1350 1351 1351
TYPE                   0 : 1362
LOCAL: NEWHAND          1277 : 1277 1330 1336 1360 1376 1392
-----
FUNCT: HANDFKEYS        FILE=ORCA2.CC
GLOBL: BASEPAGE         0 : 566
BASESTATUS             0 : 587
BLINKSCLEARED          0 : 512 570 576
CHAR                   0 : 513 514 516 518 520 523 565
DUMMYPTR               0 : 583
FKEY                   0 : 522 525 528 539 543 547 551 555 559 563 569 569 570 579 584
GRIPACCEL              0 : 531 536
I                       0 : 572 572 572 574

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[illegible]

[illegible]

[illegible]

[illegible]

NAMES	0 :	1057	1058	1248														
NEWRACK	0 :	1009	1015	1045	1054	1112	1138	1147	1154	1177	1186	1195	1249					
NUMBER	0 :	1140	1141	1143	1144	1144	1146	1147	1149	1152	1156	1161	1171	1172	1179	1180		
PENDINGANGLE	0 :	1274																
PENDINGHEIGHT	0 :	1272																
PENDINGREACH	0 :	1273																
RACKCOMMANDENTRYPTR	0 :	995	1005	1256	1260	1275												
RACKCOMMANDPTR	0 :	1006																
RAMPTR	0 :	1071																
REACH	0 :	1131	1168	1209														
REACHACCEL	0 :	1111																
REACHTRANSOFFSET	0 :	1111																
REFANGLE	0 :	1274																
REFHEIGHT	0 :	1272																
REFREACH	0 :	1273																
RESPONSE	0 :	1005	1007	1071	1072	1256	1260	1263										
RN0	0 :	1131	1132	1132	1133	1168	1169	1169	1170	1209	1210	1210	1211					
RN1	0 :	1132	1134	1135	1169	1173	1174	1210	1213	1214								
RN2	0 :	1133	1134	1135	1170	1173	1174	1211	1213	1214								
RN3	0 :	1171	1173	1174	1175	1212	1213	1214	1215									
ROTARYACCEL	0 :	1111																
ROTARYTRANSOFFSET	0 :	1111																
ROW	0 :	1179	1188	1193	1212	1219	1233											
SPACES	0 :	1035	1035	1068	1068	1124	1124											
TYPE	0 :	1013	1251															
VERTICALACCEL	0 :	1111																
VERTICALTRANSOFFSET	0 :	1111																
X1	0 :	1134	1173	1213														
Y1	0 :	1135	1174	1214														
Z1	0 :	1136	1175	1215	1246	1246												
LOCAL : MOVERACK	993 :	993	1020	1026	1112													
TEMPINT	994 :	994	1239	1246														

FUNCT: RANGECHECKSPEEDIN	FILE=ORCA1.CC																	
DEFIN: VARIABLECOMMAND	0 :	2289	2291	2295	2297	2301												
G : VALUE	0 :	2289	2291	2295	2297	2301												
P : MAXSPEED	2287 :	2285	2287	2295	2297													
MINSPEED	2286 :	2285	2286	2289	2291													

FUNCT: RANGECHECKPOSITION	FILE=ORCA1.CC																	
DEFIN: VARIABLECOMMAND	0 :	2307	2309	2313	23													

```

-----
F:  - RESTOREPOSITION      FILE=ORCA1.CC
G:  : ANGLE                 0 : 1861
    : FIRSTDISPLAY         0 : 1865
    : GRIP                  0 : 1863
    : HEIGHT                0 : 1859
    : PENDINGANGLE         0 : 1861
    : PENDINGGRIP          0 : 1863
    : PENDINGHEIGHT        0 : 1859
    : PENDINGREACH         0 : 1860
    : PENDINGSYRINGE       0 : 1864
    : PENDINGWRIST         0 : 1862
    : REACH                 0 : 1860
    : SYRINGE               0 : 1864
    : WRIST                 0 : 1862
-----

```

```

-----
FUNCT: RETURNCHECKSUMOK    FILE=ORCA3.CC
GLOBL: I                   0 : 212  212  212  214
    : ROBOTMESSAGE         0 : 214  216
    : TEXT                  0 : 214  216
PARAM: BUFFERINDEX        207 : 206  207  212
    : CHECKSUMINDEX        208 : 206  208  212  216
LOCAL: RETURNCHECK        210 : 210  211  214  214  216
-----

```

```

-----
FUNCT: RETURNTOEXEC       FILE=ORCA1.CC
DEFIN: COMMAND            0 : 2340
    : COMMANDMSG           0 : 2342
GLOBL: ABORT               0 : 2338
    : COMMANDCODE          0 : 2340
    : COMMANDMSGPTR        0 : 2342
    : RESPONSEID           0 : 2342
-----

```

```

-----
FUNCT: SAVECALIBRATIONDATA FILE=ORCA2.CC
GLOBL: CALFACTOR.HEIGHT    0 : 817
    : CALFACTOR.WRIST      0 : 820
    : ROBOTMESSAGE         0 : 817  820
    : TEXT                  0 : 817  820
-----

```

```

-----
I:  : SENDMESSAGEITILLGOODSTATUS FILE=ORCA3.CC
GLOBL: J                   0 : 174  175
    : KEYPADSTATUS         0 : 162  171  171
    : MESSAGEPTR           0 : 161
    : MYMODULEID           0 : 179
    : NAMEFORMAT           0 : 173
    : RETURNCODE           0 : 162  174
    : RETURNEXCHANGE.EXCHANGEID 0 : 161
    : ROBOTMESSAGE         0 : 160  162  174
LOCAL: GOOD                155 : 155  157  158  185
    : TRIES                 154 : 154  156  164  164  165  169
-----

```

```

-----
FUNCT: SETABSOLUTE        FILE=ORCA2.CC
DEFIN: COMMAND            0 : 268  270  272
GLOBL: ANGLE               0 : 271  272  272
    : HEIGHT               0 : 267  268  268
    : REACH                 0 : 269  270  270
    : REFANGLE             0 : 271
    : REFHEIGHT            0 : 267
    : REFREACH             0 : 269
-----

```

```

-----
FUNCT: SETFACTORYCAL      FILE=ORCA2.CC
GLOBL: CALFACTOR.ANGLE     0 : 832
    : CALFACTOR.ANGLEZERO  0 : 835
    : CALFACTOR.GRIP       0 : 844
    : CALFACTOR.GRIPZERO   0 : 847
    : CALFACTOR.HEIGHT     0 : 830
    : CALFACTOR.HEIGHTZERO 0 : 833
    : CALFACTOR.REACH      0 : 831
    : CALFACTOR.REACHZERO  0 : 834
    : CALFACTOR.SYRINGE    0 : 845
    : CALFACTOR.SYRINGEZERO 0 : 848
    : CALFACTOR.WRIST      0 : 843
    : CALFACTOR.WRISTZERO  0 : 846
I:  : AXISID              826 : 825  826  828  828  836  841  841  849
-----

```

```

-----
FUNCT: SETHAND            FILE=ORCA2.CC
DEFIN: HANDCOMMAND        0 : 286  287  288
GLOBL: GRIP               0 : 287  287
    : SYRINGE             0 : 288  288
-----

```

WRIST		0 : 286	286														
FUNCT: SETRELATIVE		FILE=ORCA2.CC															
GLOBL: COMMAND		0 :	278	279	280												
GLOBL: ANGLE		0 :	280	280													
GLOBL: HEIGHT		0 :	278	278													
GLOBL: REACH		0 :	279	279													
GLOBL: REFANGLE		0 :	280														
GLOBL: REFHEIGHT		0 :	278														
GLOBL: REFREACH		0 :	279														
FUNCT: SETUPROBOTMESSAGE		FILE=ORCA3.CC															
GLOBL: BYTESIN		0 :	145														
GLOBL: BYTESOUT		0 :	144														
GLOBL: LENGTH		0 :	146														
GLOBL: ROBOTMESSAGE		0 :	144	145	146	146	147	148									
GLOBL: TEXT		0 :	147	148													
PARAM: COMMAND		142 :	139	142	148												
PARAM: DATABYTESIN		141 :	139	141	145	146											
PARAM: DATABYTESOUT		140 :	139	140	144	146	147										
FUNCT: STOPANDREINITROBOT		FILE=ORCA2.CC															
GLOBL: ABORT		0 :	365														
GLOBL: ANGLE		0 :	366														
GLOBL: BASESTATUS		0 :	377	377													
GLOBL: CHAR		0 :	383	384	386												
GLOBL: COMMANDMODE		0 :	336	353	370	381											
GLOBL: FIRSTDISPLAY		0 :	372														
GLOBL: HEIGHT		0 :	367														
GLOBL: KEYMESSAGE		0 :	352														
GLOBL: KEYPADSTATUS		0 :	332	332	357	363	388	388									
GLOBL: MOVING		0 :	348														
GLOBL: MYMODULEID		0 :	359														
GLOBL: PENDINGANGLE		0 :	366														
GLOBL: PENDINGHEIGHT		0 :	367														
GLOBL: PENDINGREACH		0 :	368														
GLOBL: PENDINGWRIST		0 :	369														
GLOBL: REACH		0 :	368														
GLOBL: SPACES		0 :	389	389													
GLOBL: STOPKEYPRESSED		0 :	334	376													
GLOBL: STOPPEDMESSAGE		0 :	338	342													
GLOBL: WRIST		0 :	369														
PARAM: WRISTSTATUS		0 :	378	378													
PARAM: AXISID		330 :	329	330	349												
FUNCT: STOPMONITOR		FILE=ORCA3.CC															
GLOBL: MOVING		0 :	252														
GLOBL: STOPEXCHANGE.EXCHANGEID		0 :	256														
GLOBL: STOPMONITORACTIVE		0 :	253	255													
GLOBL: STOPTASKMESSAGE		0 :	256														
FUNCT: STOPPROGRAM		FILE=ORCA2.CC															
DEFIN: WORDDATA		0 :	1425	1426													
GLOBL: BYTESIN		0 :	1428														
GLOBL: BYTESOUT		0 :	1427														
GLOBL: CHANNELMESSAGEDESCRIPTOR		0 :	1409														
GLOBL: CHANNELPTR		0 :	1424														
GLOBL: CONTROLIMAGE		0 :	1422														
GLOBL: DESTINATIONID		0 :	1414														
GLOBL: HOMEID		0 :	1413														
GLOBL: KEYPADSTATUS		0 :	1442														
GLOBL: LENGTH		0 :	1429														
GLOBL: MAXRXWAIT		0 :	1417														
GLOBL: MAXTXWAIT		0 :	1418														
GLOBL: MOVING		0 :	1438	1442	1448												
GLOBL: MYMODULEID		0 :	1413														
GLOBL: POSTTERMCHARS		0 :	1421														
GLOBL: RESPONSEID		0 :	1415														
GLOBL: STOPEXCHANGE.EXCHANGEID		0 :	1415	1436	1446												
GLOBL: STOPKEYPRESSED		0 :	1447														
GLOBL: STOPMESSAGE		0 :	1412	1413	1414	1415	1416	1417	1418	1419	1420	1421	1422	1424	1427	1428	1429
GLOBL: STOPMONITORACTIVE		0 :	1451														
GLOBL: TERMCHAR1		0 :	1419														
GLOBL: TERMCHAR2		0 :	1420														
GLOBL: TEXT		0 :	1430	1431	1432	1433											
GLOBL: TYPE		0 :	1416														
LOCAL: ACCESSPTR		1410 :	1410	1424													
LOCAL: COUNTER		1407 :	1407	1437	1438	1441	1441										

MESSAGEPTR	1408 : 1408	1436	1440	1446										
STOPMESSAGEPTR	1409 : 1409	1412												

1: STOREANDCHECKSYMBOL	FILE=ORCA2.CC													
1: COMMANDENTRY	0 : 673	673												
GLOBAL: CURRENTNAME	0 : 673													
NAMELENGTH	0 : 673	673												
RAMPTR	0 : 674													
RESPONSE	0 : 674	675	681											

FUNCT: STORECOMMANDVARIABLE	FILE=ORCA2.CC													
DEFIN: COMMANDVARIABLE	0 : 702	703	705	705	705	706	707	708	708	709	709			
VARIABLEDATA	0 : 710	711												
GLOBAL: ABBREV	0 : 708													
FORMAT	0 : 707													
LENGTH	0 : 705													
MODULEID	0 : 710													
MYMODULEID	0 : 710													
NAME	0 : 709													
NAMELENGTH	0 : 702	703	705	708	709									
SPACES	0 : 701	701												
TYPE	0 : 706													
VARIABLEDATAPTR	0 : 709													
PARAM: COL	697 : 695	697	702											
COMMANDCODE	698 : 695	698	711	711										
FORMATCODE	699 : 695	699	707											
ROW	696 : 695	696	702											

FUNCT: STOREIMMEDIATECOMMAND	FILE=ORCA2.CC													
DEFIN: COMMAND	0 : 731	732												
COMMANDENTRY	0 : 723	724	726	726	726	727	728	729	729	730	730			
GLOBAL: ABBREV	0 : 729													
COMMANDPTR	0 : 730													
FORMAT	0 : 728													
LENGTH	0 : 726													
MODULEID	0 : 731													
MYMODULEID	0 : 731													
NAME	0 : 730													
NAMELENGTH	0 : 723	724	726	729	730									
SPACES	0 : 722	722												
TYPE	0 : 727													
PARAM: COL	719 : 717	719	723											
COMMANDCODE	720 : 717	720	732	732										
ROW	718 : 717	718	723											

FUNCT: STOREROBOTPOSITION	FILE=ORCA2.CC													
DEFIN: COMMAND	0 : 745	750	751											
COMMANDENTRY	0 : 742	743	745	745	745	746	747	748	748	749	749			
GLOBAL: ABBREV	0 : 748													
ABSOLUTESIGN	0 : 762													
COMMANDPTR	0 : 749													
FORMAT	0 : 747													
HANDSIGN	0 : 754													
LENGTH	0 : 745													

[illegible]

FUNCT: ZYMATEHANDWAIT FILE=ORCA3.CC
 G' ABORT 0 : 801
 AXISERROR 0 : 771 772 779 794 803
 DUMMYPTR 0 : 789
 MAXRXWAIT 0 : 775 777
 MOVING 0 : 778
 ROBOTMESSAGE 0 : 775 777 780 791
 TEXT 0 : 780 791
 WRISTSTATUS 0 : 780 781 783 787 791 798
 LOCAL: HOLDMMSG 770 : 770 785

FUNCT: ZYMATEPROGRAMMING FILE=ORCA1.CC
 GLOBL: ANGLESPEED 0 : 2171
 BASEPAGE 0 : 2150 2161 2164 2172 2239 2246
 CHAR 0 : 2167 2253 2254 2256 2257 2259
 DUMMYPTR 0 : 2266
 FIRSTDISPLAY 0 : 2156
 HEIGHTSPEED 0 : 2171
 MAINMESSAGE 0 : 2241
 PRESSREMESSAGE 0 : 2251
 REACHACCEL 0 : 2171
 REACHSPEED 0 : 2171
 REACHTRANSOFFSET 0 : 2171
 ROTARYACCEL 0 : 2171
 ROTARYTRANSOFFSET 0 : 2171
 SPACES 0 : 2170 2170 2180 2180 2186 2186 2198 2198 2221 2221 2264 2264
 VERTICALACCEL 0 : 2171
 VERTICALTRANSOFFSET 0 : 2171
 WAITFORRETURN 0 : 2169 2211 2215 2225 2229 2249
 ZPCASE 0 : 2160 2161 2163 2164 2167 2174
 LOCAL: ZPKEYS 2149 : 2149 2161 2167 2167

FUNCT: ZYMATEWAIT FILE=ORCA3.CC
 GLOBL: ABORT 0 : 423
 AXISERROR 0 : 335 336 368 417 425
 BASESTATUS 0 : 369 370 373 376 379 385 391 403 410 414
 DUMMYPTR 0 : 412
 MAXRXWAIT 0 : 361 363
 MOVING 0 : 366
 ROBOTMESSAGE 0 : 361 363 369 414
 TEXT 0 : 369 414
 PARAM: WAITTYPE 331 : 330 331 338 338 342 364
 LOCAL: HOLDMMSG 334 : 334 405
 THERMALMSG 333 : 333 399

**C-DOC
COMPLEXITY ANALYSIS**

Function vs Complexity/Quality

** *****

		Path COMPLXITY	'C' Stmts	CODE Lines	CMMNT Lines	Total Lines
(nwtl)	ORCA1.CC	0	205	243	307	529
BASECOORDINATESCREEN	ORCA1.CC	7	26	36	2	38
BASEFKEYS	ORCA2.CC	19	51	95	1	101
BASEFUNCTIONSCREEN	ORCA1.CC	1	14	16	1	19
BASESENSESCREEN	ORCA1.CC	7	31	41	2	43
BASESPEEDSCREEN	ORCA1.CC	8	30	40	2	42
CALCULATEBASEAXISCOUNTS	ORCA3.CC	1	5	7	0	9
CALCULATEHANDAXISCOUNTS	ORCA3.CC	2	8	14	0	17
CALIBRATIONSCREEN	ORCA1.CC	9	57	81	9	94
CHANGELOCATIONSCREEN	ORCA1.CC	8	33	49	0	53
CLEARFUNCTIONAREA	ORCA1.CC	3	5	11	0	13
CLEARKEYBOXES	ORCA1.CC	2	4	8	13	21
CLEARNAMEAREA	ORCA1.CC	1	3	5	1	7
COMMUNICATEWITHROBOT	ORCA3.CC	4	11	19	1	22
COMPUTEABSOLUTE	ORCA2.CC	1	4	6	0	8
COMPUTECHECKSUM	ORCA3.CC	2	8	12	0	14
COMPUTEHAND	ORCA2.CC	1	4	6	1	8
COMPUTERACKLOCATION	ORCA2.CC	4	18	31	3	36
COMPUTERELATIVE	ORCA2.CC	1	4	6	0	8
DELETETCOMMANDSCREEN	ORCA1.CC	5	19	35	1	41
DISPLAYBASEFORCES	ORCA2.CC	4	20	34	0	39
DISPLAYBASEFUNCTIONKEYS	ORCA1.CC	1	11	13	0	15
DISPLAYCOLLISIONMESSAGE	ORCA2.CC	9	25	55	0	60
DISPLAYCURRENTGRIPFORCE	ORCA2.CC	2	8	14	0	17
DISPLAYCURRENTHAND	ORCA2.CC	2	4	8	0	10
DISPLAYHANDFUNCTIONKEYS	ORCA1.CC	1	10	12	0	14
DISPLAYMAINSRREEN	ORCA1.CC	2	20	24	0	26
DISPLAYNUMBER	ORCA3.CC	1	13	15	0	17
DIVRND	ORCA3.CC	2	7	13	1	15
DOBASEZEROS	ORCA1.CC	12	30	54	2	57
DOCAL	ORCA1.CC	8	35	61	1	68
DOCTIONCONTROL	ORCA3.CC	2	24	30	1	33
DOSTZEROS	ORCA1.CC	12	30	54	1	57
UPPER	ORCA2.CC	2	6	12	0	15
GETBASEFORCEVALUES	ORCA3.CC	1	8	10	2	14
GETCALIBRATIONDATA	ORCA2.CC	2	14	20	1	23
GETDICTIONARYHANDOFFSETS	ORCA2.CC	1	4	6	0	8
GETPOSITION	ORCA2.CC	13	50	99	9	112
GETSCALEDATA	ORCA1.CC	1	3	5	0	7
GETSCALEDNR1	ORCA1.CC	3	11	19	0	22
GETWRISTFORCEVALUES	ORCA3.CC	1	7	9	1	11
HANDCOORDINATESCREEN	ORCA1.CC	7	26	36	2	38
HANDDEFINITIONSCREEN	ORCA1.CC	12	80	119	6	131
HANDFKEYS	ORCA2.CC	17	46	82	1	86
HANDFUNCTIONSCREEN	ORCA1.CC	1	11	13	1	16
HANDSENSESCREEN	ORCA1.CC	7	29	39	2	41
HANDSPEEDSCREEN	ORCA1.CC	8	30	40	2	42
INITZYMATE	ORCA1.CC	92	412	583	13	628
INITZYMATEROBOT	ORCA2.CC	3	55	61	12	74
INPUTANDMOVETORACKINDEX	ORCA1.CC	3	16	24	0	27
LOADDATABASE	ORCA3.CC	4	30	44	0	49
LOADDATABASEWAIT	ORCA1.CC	1	12	14	0	15
LOADDATAWRIST	ORCA3.CC	4	24	38	0	43
LOADDATAWRISTWAIT	ORCA1.CC	1	9	11	0	12
MONUMENTSCREEN	ORCA1.CC	20	98	158	4	174
MOVEHAND	ORCA3.CC	2	9	13	0	15
MOVEHANDTILLACKNOWLEDGE	ORCA2.CC	2	4	8	1	11
MOVETOCOORDINATESSCREEN	ORCA1.CC	14	38	66	0	68
MOVETOLOCATIONSCREEN	ORCA1.CC	65	270	349	36	398
MOVETORACKINDEX	ORCA2.CC	9	41	74	13	92
MOVEZYMATE	ORCA3.CC	19	70	118	29	154
MOVEZYMATETILLACKNOWLEDGE	ORCA2.CC	2	5	9	2	13
PROGRAMMINGCOMMANDSCREEN	ORCA1.CC	9	34	44	2	46
RACKSETUPSCREEN	ORCA2.CC	33	181	271	4	288
RANGECHECKEDSPEEDIN	ORCA1.CC	3	9	17	0	20
RANGECHECKPOSITION	ORCA1.CC	3	6	14	0	17
RANGECHECKVALUE	ORCA1.CC	3	8	16	0	19
POSITIONCONTROL	ORCA3.CC	1	18	20	0	22
MESSAGEAREAANDUART	ORCA3.CC	1	30	32	19	41
RESTOREPOSITION	ORCA1.CC	1	9	11	0	13
RETURNCHECKSUMOK	ORCA3.CC	3	11	19	0	22
RETURNTOEXEC	ORCA1.CC	2	4	8	1	10
SAVECALIBRATIONDATA	ORCA2.CC	1	7	9	0	11

SENDMESSAGE TILLGOODSTATUS	ORCA3.CC	6	22	36	1	40
SF SOLUTE	ORCA2.CC	1	7	9	0	11
S .TORYCAL	ORCA2.CC	5	20	30	0	32
: ND	ORCA2.CC	1	4	6	0	8
SEI RELATIVE	ORCA2.CC	1	4	6	0	8
SETUPROBOTMESSAGE	ORCA3.CC	1	9	11	0	13
STOPANDREINITROBOT	ORCA2.CC	9	38	60	1	65
STOPMONITOR	ORCA3.CC	2	5	9	0	11
STOPPROGRAM	ORCA2.CC	4	38	46	8	51
STOREANDCHECKSYMBOL	ORCA2.CC	3	10	20	0	24
STORECOMMANDVARIABLE	ORCA2.CC	2	16	20	0	22
STOREIMMEDIATECOMMAND	ORCA2.CC	2	15	19	0	21
STOREROBOTPOSITION	ORCA2.CC	4	23	35	0	39
TELLPOSITION	ORCA3.CC	14	52	94	2	105
TESTHANDPOSITION	ORCA3.CC	7	16	36	1	41
TESTNEWFORPENDING	ORCA1.CC	2	5	11	0	14
TESTZYMATEPOSITION	ORCA3.CC	7	16	36	0	41
TOINTEGER	ORCA3.CC	2	6	12	1	15
UPDATELASTNAME	ORCA2.CC	3	11	17	0	19
VALUEENTERED	ORCA1.CC	8	35	56	3	60
VIBRATORUNITS	ORCA1.CC	4	11	19	1	20
WRISTCALIBRATIONSCREEN	ORCA1.CC	9	58	82	3	90
ZYMATEHANDPROGRAMMING	ORCA1.CC	17	76	92	1	93
ZYMATEHANDWAIT	ORCA3.CC	7	26	44	1	46
ZYMATEPROGRAMMING	ORCA1.CC	21	101	121	3	124
ZYMATEWAIT	ORCA3.CC	17	54	96	9	104
TOTAL SYSTEM SUMMARY		680	3190	4711	548	5516
